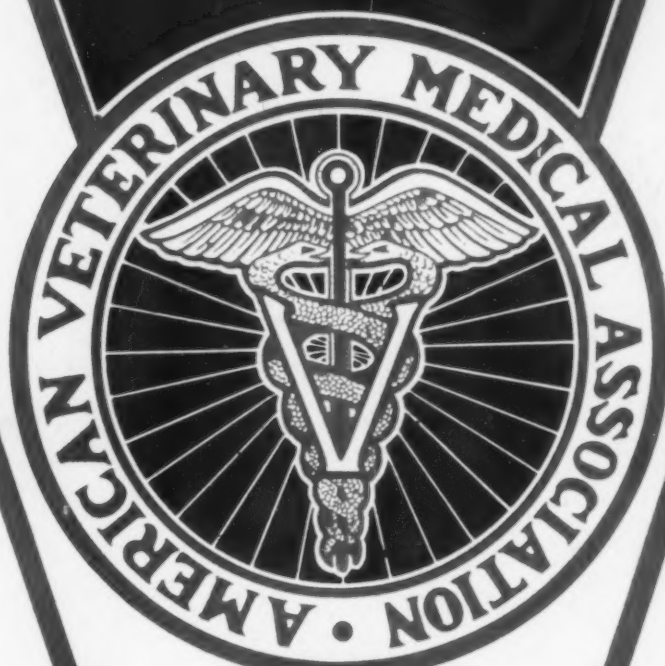


JOURNAL

OF THE



Headquarters
Changed to:
Palmer House

79th
Annual
Meeting

Date
Changed to:
August 24-27,
1942

Program Information

*From C. M. Harvey to
Biology Library*



**To
guard well**

**The Purity of Food
The Source of Food
The Supply of Food
is a solemn trust**

assigned by orderly governments to a legally constituted profession of college-trained doctors of veterinary medicine who are charged to

Assure the Purity by practicing scientific methods of inspection; *Guard the Source* against the peril of disease in farm animals; and *Govern the Supply* through livestock loss prevention.

To these ends, an accredited system of veterinary education operates under public sanction; laws on animal health are enacted by and through the will of the people; and societies of veterinary science are maintained to encourage uniform disease-control measures. In the United States, the results are unparalleled in the history of medicine.

INTERRUPTING THE AMERICAN SYSTEM OF ANIMAL DISEASE CONTROL MAY HAVE A REGRETTABLE SEQUEL.



HOME OFFICES AND BIOLOGICAL LABORATORIES, OMAHA, NEBR.

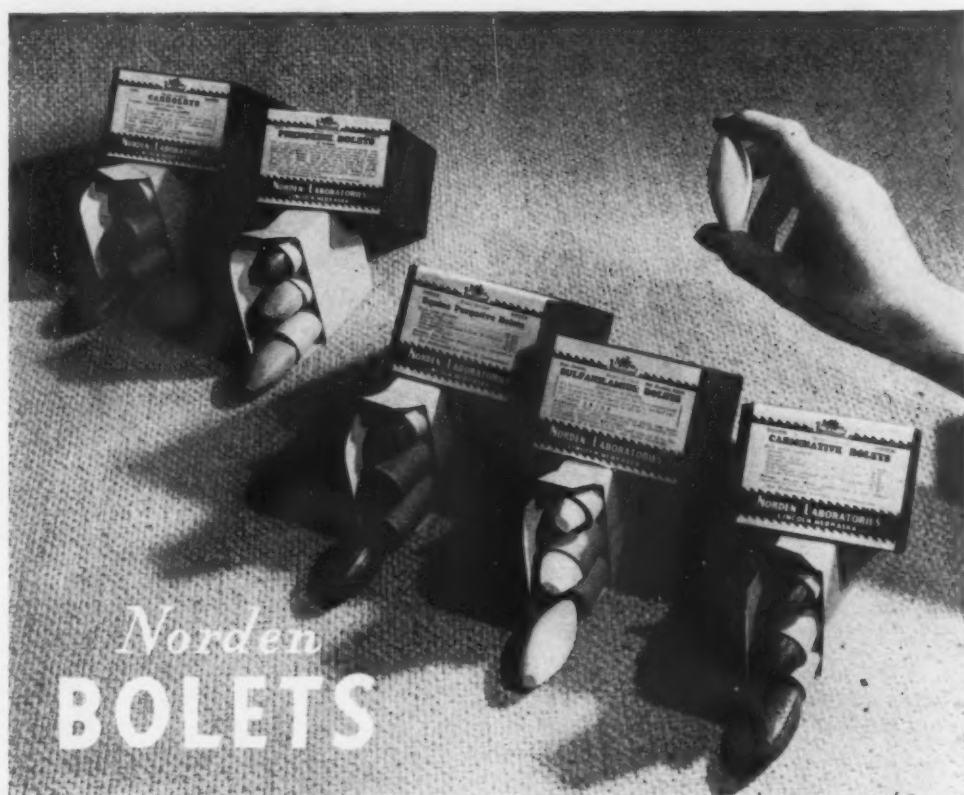


SERUM PLANT, RALSTON, NEBR.



SERUM PLANT, 34TH ST. AND U ST., OMAHA, NEBR.

The Corn States Serum Co.
Omaha, Nebraska



A Triumph in Dosage Accuracy, Efficiency and Economy

CARBOLETS

For Oral and Intra-Uterine Administration

Charcoal in Bolet base. Antacid, Anti-ferment, absorbent.

Doz. \$0.90 6 doz. \$5.15
12 dozen \$9.75

EQUINE PURGATIVE

*Full Dosage
Replacing Capsules*

Aloes, Barium Chloride, Nux Vomica, Podophyl-
lum, Ginger.

Doz. \$2.00 6 doz. \$11.40

CARMINATIVE

(Non-volatile)

Stronger than Reeks and permanent

Cresol, Salicylic Acid, Ginger, Capsicum, Nux Vomica, Sod. Carb.

Doz. \$1.50 6 doz. \$8.50

PHENOZINE

More Convenient

Each Bolet contains 12 gms. phenothiazine. An-
thelmintic for sheep, large hogs, cattle and
horses.

Doz. \$1.10 6 doz. \$6.25
100 \$8.00

SULFANILAMIDE

Economical

250 gr. Sulfanilamide. For economical and con-
venient administration of large dosage.

Doz. \$2.00 6 doz. \$11.40

Bolets Fit the Balling Gun

NORDEN LABORATORIES
LINCOLN *"The Mark of Quality"* **NEBRASKA**

Journal of the American Veterinary Medical Association

CONTENTS

CHICAGO MEETING

Change in Dates and Headquarters.....	83
General Sessions Program.....	84

GENERAL ARTICLES

The Use of Sulfonamides in the Treatment of Calf Diphtheria—James Farquharson.....	88
A Scientific Assay of Agricultural Education.....	93
The Veterinary Profession and the AVMA—H. W. Jakeman.....	97
Tests with Nicotinic Acid for the Prevention of Infectious Swine Enteritis — B. H. Edgington, W. L. Robison, Wise Burroughs and R. M. Bethke.....	103
The Etiology of Summer Eczema in Dogs—Alfred Kissileff.....	108
Phenothiazine-Medicated Pellets for Range Sheep—Ernest C. McCulloch.....	114
Calfhood Vaccination in a Brucellosis Control Program in Certified Dairies—C. W. Boynge.....	120

SURGERY AND OBSTETRICS

Diagnosis of Pregnancy in the Mare by Hormonal Means—H. H. Cole and G. H. Hart....	124
Perforating Peptic Ulcer in a Dog—Gerry B. Schnelle and Myron S. Arlein.....	129
Pregnancy Disease of Ewes.....	130
Hermaphroditism in a Dog—George H. Ludins.....	131
Index of Clinical Material—Torsion of the Uterus.....	132
Surgical Treatment of Teat Fistula.....	132

CLINICAL DATA

Blood Substitutes	133
Typhus Vaccine Under Critical Test.....	133
Mammary Rest in Mastitis.....	133
Brucellosis from Goats in Mexico.....	133
Cow's Urine in Coccidiosis of Chickens.....	133

(Continued on page iv)

OFFICERS: H. W. Jakeman, *President*; W. W. Dimock, *President-Elect*; J. G. Hardenbergh, *Executive Secretary*; M. Jacob, *Treasurer*.

EXECUTIVE BOARD: O. V. Brumley, *Chairman*; C. W. Bower, *Member-at-Large*; A. E. Cameron, *1st District*; W. H. Ivens, *2nd District*; J. L. Axby, *3rd District*; W. E. Cotton, *4th District*; F. M. Wilson, *5th District*; W. L. Curtis, *6th District*; Chas. H. Seagraves, *7th District*; Ashe Lockhart, *8th District*; W. A. Hagan, *9th District*; O. V. Brumley, *10th District*; H. W. Jakeman, *ex-officio*; W. W. Dimock, *ex-officio*.

BOARD OF GOVERNORS: O. V. Brumley, *Chairman*; H. W. Jakeman; W. W. Dimock (= Committee on Journal).

EDITORIAL STAFF: L. A. Merillat and J. G. Hardenbergh, *Editors*; Helen S. Bayless, *Assistant to the Editors*. *Associate Editors*: J. R. Beach, E. A. Benbrook, R. R. Birch, John B. Bryant, J. A. Campbell, C. H. Case, James Farquharson, Ward Giltner, W. F. Guard, Raymond A. Kelser, J. A. S. Millar, John R. Mohler, J. E. Shillinger.

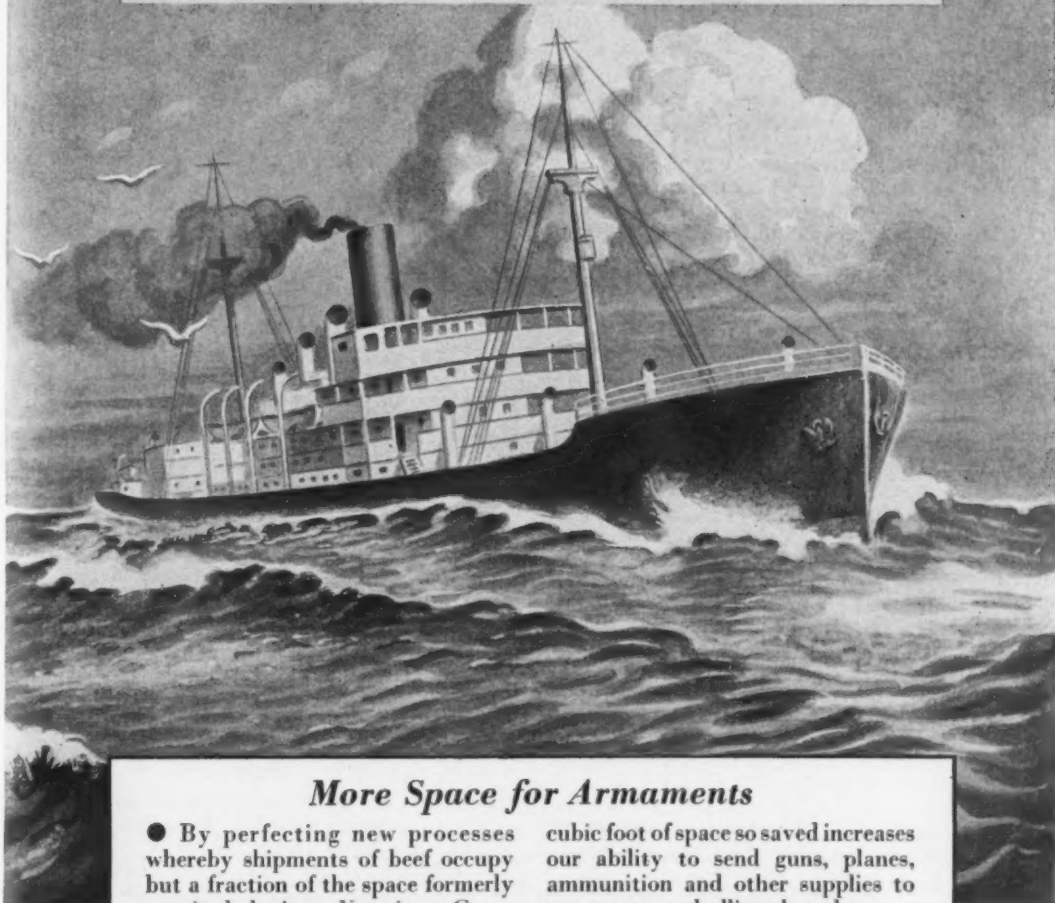
FOREIGN LANGUAGE ABSTRACTING: Chas. H. Haasjes (Dutch), E. E. Hamann (German), A. G. Karlson (Scandinavian).

\$5.00 per annum.

Foreign \$6.00; Canada \$6.00 Single Copies 75 cts. prepaid in U. S.

Published monthly at 600 S. Michigan Ave., Chicago, Ill., by the American Veterinary Medical Association. Entered as second class matter August 10, 1932, at the Post Office at Chicago, Illinois, under the act of March 3, 1879. Accepted for mailing at special rate of postage provided for in Section 538, act of February 28, 1925, authorized August 10, 1932. Contents copyright 1942. Reproduction of any part of this publication is prohibited, unless special permission is given. Permission will be given if the purpose seems justifiable and, in signed articles, if the rights or requests of the author are not violated thereby. Reprints should be ordered in advance. Prices will be quoted after publication. Please send prompt notice of change of address, giving both old and new. Advise whether the change is temporary or permanent. Address all correspondence to American Veterinary Medical Association.

WHAT THE VETERINARY PROFESSION MEANS TO MANKIND



More Space for Armaments

● By perfecting new processes whereby shipments of beef occupy but a fraction of the space formerly required, the Army Veterinary Corps has increased our country's capacity to transport arms and ammunition.

By methods evolved by these veterinarians, all bones, tendons and waste materials, including unnecessary fat, are removed. In this exceedingly compact form, the beef is then frozen solid, in which condition it is transported and stored. Every

cubic foot of space so saved increases our ability to send guns, planes, ammunition and other supplies to our troops and allies abroad.

Thus, while civilian veterinarians continue their work of guarding America's meat-producing animals, members of that profession in the U. S. Army, in addition to safeguarding the animals used by the Army, and inspecting the foods supplied to our fighting men, have been of vital service to their country.

One of a series of advertisements on behalf of the Veterinary Profession published by

ALLIED LABORATORIES, INC.

Operating:
Pitman-Moore Co., Indianapolis, Ind.
Royal Serum Co., Kansas City, Kansas

Sioux City Serum Co., Sioux City, Iowa
Sioux Falls Serum Co., Sioux Falls, S. D.
United Serum Co., Kansas City, Kansas

Copies of this page, free of advertising, sent on request.

CONTENTS—Continued

Glucose in Acetonemia.....	133
Fern Poisoning in Texas.....	134
Three Common Toxic Plants.....	135
The Toxicity of Foliage of <i>Aleurites Fordi</i> for Cattle—M. W. Emmel, D. A. Sanders and L. E. Swanson.....	136
Pruritus of the Tail.....	137
Control of Swine Erysipelas.....	138
Surgical Gut.....	138
Thiamin Hydrochloride.....	139
Gramicidin and Throthricin.....	139
Sulfaguanidine in Swine Enteritis.....	140
Clinical Expressions of Avitaminosis A.....	140
To Disinfect Baby-Chick Boxes.....	140
Phenothiazine as an Anthelmintic in Sheep.....	140

EDITORIAL

Interesting Facts About AVMA Meetings.....	141
Major George William Duncan 1887-1942.....	143
The AMA Session of '42 and Ours.....	143
The Advancement of Science.....	143
Time for a Showdown.....	145
Doing One's Duty Not a Play of Words.....	145
Doctor Eichhorn Addresses Inter-American Conference.....	146
They'll Help Win the War.....	147

CURRENT LITERATURE

Abstracts: Tyrothricin in Bovine Streptococic Mastitis, 148; Mastitis and the Plate Count of Milk, 148; Loss of Meat Poundage from Disease, 148; Science and Industry Turns to the Farmer, 149; Equine Encephalomyelitis in Man and St. Louis Encephalitis, 149; Paratyphoid Infection in Poultry, 149; Intracervical Survival of Spermatozoa, 149; Friendly Microbe in Beer, 150; Blood Protozoan of Turkeys Transmitted by Flies, 150; Wief's Disease, 150; Tularemia in Sheep, 151; Effects of Low Temperature Exposure on Worm Eggs and Larvae of Equine Strongiloidae Nematodes, 151; The Cattle of North America, 151; Science Integrates the World, 152; Antimony in Human and Veterinary Medicine, 152; Infertile Incubator Eggs for Hogs, 152; Veterinarians Nutrition Conscious, 153; The Origin of Cancer, 153; Amyloidosis in Mink, 153; The Passage of Milk Into the Rumen and Reticulum of Calves, 154; Control Animal Parasites, 154.

Book Notices: A New Journal of Science, 154; War Gases, 154; Treatment of War Wounds, 155; National Poultry Improvement Plan, 155; Analytical Chemistry of Industrial Poisons, Hazards and Solvent, 156; The Importance of Vitamin D for Cattle, 156.

THE NEWS

AVMA Activities.....	157
Applications.....	158
U. S. Government.....	165
Among the States.....	169
Coming Meetings.....	176
Births.....	176
Deaths.....	176

MISCELLANEOUS

Former American Veterinary Officer Honored, 102; A Necessary Investment, 113; Do Sulfa Drugs Prevent Natural Immunity?, 113; Urges the Use of More Horses, 113; Australian Veterinary Medical Association, 168.

VETERINARY PREPAREDNESS

Restatement of Duties of the Various Units of the Procurement and Assignment Service.....	177
Nearly 90 Per Cent Return of Veterinary Enrollment and Questionnaire Forms Reported.....	178
Loans Provided for Students Under Accelerated Curriculums.....	178
Status of Students from Cobelligerent and/or Neutral Countries.....	179
Appointments to the War Manpower Commission.....	180
Shortage of Physicians Acute.....	180
An' Related Topics.....	xvi

Journal of the American Veterinary Medical Association

Copyright 1942 by American Veterinary Medical Association
600 S. Michigan Ave., Chicago, Ill.

VOL. CI

AUGUST 1942

NO. 785

Change in Dates and Headquarters 79th Annual Meeting

The taking over of the Stevens Hotel by the Army, effective August 1, 1942, has caused a sudden change in dates and hotel headquarters for this year's convention. The new dates are August 24-27 inclusive, and the new headquarters, the Palmer House.

Forewarned of the incident, the Board of Governors convened in Chicago on July 13 and gave full consideration to all aspects of the situation affecting the plans for the regular annual meeting. The possible need of cancelling the meeting and holding only a business session of the Executive Board and House of Representatives was discussed at length. Members of the Committee on Local Arrangements were interviewed and a survey was made of the nearly forty technical exhibitors who participate in the meeting. The response to all inquiries was overwhelmingly in favor of going ahead with the 1942 meeting as planned.

The Board of Governors finally decided that the holding of a regular session is imperative in order to transact necessary association business, including the election of officers, in regular form. Moreover, the need of this year's meeting is especially great because of its relation to war efforts; the program is definitely keyed to war problems. Another consideration is the possibility that a complete meeting cannot be held in 1943.

Attention is directed to additional program information on the following pages. The program of the General Sessions is evidence of the keynote of AVMA activities

and their relation to the veterinary profession and the public it serves.

The Office of Defense Transportation is not opposed to essential meetings. Make your transportation arrangements well in advance and help to make this an outstanding session.

Program Schedule.—This remains in the same general order as given in the July JOURNAL; all events are simply moved to the corresponding days of the week, August 24-27.

Hotel Headquarters.—The Palmer House was selected because it offers meeting and exhibit facilities of the highest order and assures accommodations in keeping with our meeting requirements.

All room reservations made at the Stevens have been turned over to the Palmer House and the latter hotel has written letters to the persons concerned advising them of their new room assignments. All members and others who will attend the meeting are urged to make hotel reservations at once. The Palmer House has a selection of excellent accommodations available at attractive rates. These are (all with bath):

Single Rooms	\$3.85 and up
Double Rooms	5.50 and up
Twin-bed Rooms	6.60 and up
Two-room suites (single)....	13.20 and up
Two-room suites (double)...	15.40 and up

There are several adjacent hotels with varying accommodations and rates.

GENERAL SESSIONS PROGRAM

First General Session

TUESDAY AFTERNOON, AUGUST 25
(GRAND BALL ROOM)

1:30 P. M.—Music.

- 1) Veterinary Resources as Aids to Victory—JOHN R. MOHLER, A.B., V.M.D., ScD., Chief Bureau of Animal Industry, U. S. Department of Agriculture, Washington, D. C.
- 2) The Veterinary Profession in Canada and Its Trend in War-



The Palmer House—
Chicago

The Palmer House is rich in history, as Chicago has literally grown up around it. Originally opened 13 days before the historic Chicago fire in 1871, it was rebuilt as the first fire-proof hotel in the world. Among the many famous guests of the Palmer House in the past were Adelina Patti, Mark Twain, Rudyard Kipling and President Cleveland, who received notice of his nomination in the lobby.

The present Palmer House was opened in 1925. Many of its 2200 guest rooms are air conditioned. It houses 60 shops and 34 private dining rooms. On the fourth floor is the famous exhibition hall, which is specially constructed for the purposes of conventions, also the grand ballroom and the Red Lacquer Room. The murals in the famed Chicago Room depict the Loop as it was in 1925 when the old hotel was replaced with the present building. Under the direction of William Welsh, the portrait painter, it took 40 artists two years to complete these murals.

CHICAGO MEETING — AUGUST 24-27, 1942



A Section of the Palmer House Lobby

First General Session

(Continued)

time—A. E. CAMERON, V.S., Veterinary Director General, Health of Animals Division, Dominion Department of Agriculture, Ottawa.

3) The Veterinary Profession and Its Present Responsibilities—BRIG. GEN. RAYMOND A. KELSER, Veterinary Corps, Surgeon General's Office, War Department, Washington, D. C.

4) The American Red Cross—Four-minute talk by ROGER HOLDEN, Manager, Chicago Chapter, A.R.C.

5) Nomination of Officers.

(“Clinical Depictions” will follow immediately after the close of the above session.)

Second General Session

WEDNESDAY AFTERNOON, AUGUST 26
(GRAND BALL ROOM)

1:30 P. M.—Music.

- 1) Modern War and Ancient Diseases—MARK WELSH, D.V.M., M.S., State Veterinarian, College Park, Md., and Secretary-Treasurer, United States Livestock Sanitary Association.
- 2) The Procurement and Assignment Service for Physicians, Dentists and Veterinarians—LT. COL. SAM F. SEELEY, Medical Corps, U. S. Army, Executive Officer, Procurement and Assignment Service, Washington, D. C.
- 3) Nutrition: The Veterinarian and the War Effort—R. M. BETHKE, B.S., M.S., Ph.D., President, Poultry Science Association, Wooster, Ohio.
- 4) The Use of the Reduction Splint on Animals and Man—OTTO STADER, V.M.D., B.S.A., Ardmore, Pa.
- 5) The Art of Medical Writing—L. A. MERILLAT, V.S., Editor, Journal of the American Veterinary Medical Association and American Journal of Veterinary Research.
("Clinical Depictions" will follow immediately after the close of the above session.)

Third General Session

THURSDAY MORNING, AUGUST 27
(GRAND BALL ROOM)

9:00 A. M.—Music.

- 1) Role of the Veterinarian in the Meat Industry's War Program—H. E. KINGMAN, JR., D.V.M., Veterinary Division, Wilson and Co., Chicago, Ill.
- 2) The Role of Nutrition in Health and Disease—CLIFF D. CARPENTER, D.V.M., Pathologist, Allied Mills, Inc., Fort Wayne, Ind., and Chairman, Special Committee on Poultry Diseases.
- 3) Symposium: Veterinary Participation in Civilian Defense Work and Animal Protection Measures under Wartime Conditions—
 - a) War Gases: Their Effects on Animals and Food Products, and Protection Measures—Maj. Clyde S. Price, Chemical Warfare Service, Chemical Warfare Officer, Ft. Custer, Mich.
 - b) How a County Veterinary Association Organized for Civilian Defense Work—W. F. GUARD, D.V.M., Professor of Veterinary Surgery, College of Veterinary Medicine, Ohio State University, and Chairman, Veterinary Aid Committee, Franklin County Veterinary Medical Association, Columbus, Ohio.

-
- c) The Care of Civilian Animals under Air Raid Conditions—
SIDNEY H. COLEMAN, President, American Humane Association, Albany, N. Y.
- d) Summary and Practical Hints Gained from Daily Experiences—W. A. YOUNG, D.V.M., Managing Director, The Anti-Cruelty Society, Chicago, Ill.

Additional Program Information:

See pages 1-19, inclusive, of the July JOURNAL for Section programs and condensed schedules of other program features. Transpose the events shown to the same days of the following week.



Ladies Committee—1942 AVMA Convention

FRONT ROW—Left to right—Mrs. J. V. Lacroix, Mrs. John B. Jaffray, Mrs. C. L. Miller, Chairman, Mrs. Glenn S. Ebright

MIDDLE ROW—Left to right—Mrs. J. G. Hardenbergh, Mrs. J. R. Merrick, Mrs. C. B. Krone, Mrs. E. E. Sweebe, Mrs. C. N. Bramer

BACK ROW—Left to right—Mrs. H. Preston Hoskins, Mrs. A. C. Merrick, Mrs. E. C. Khuen, Mrs. W. C. Glenney, Mrs. W. A. Young, Mrs. J. N. Parks. Absent when picture was taken: Mrs. J. K. Bone, Mrs. D. M. Campbell, Mrs. O. N. Christensen, Mrs. G. B. Merrick, Mrs. L. A. Merillat, Mrs. A. G. Misener, Mrs. J. E. Noonan, Mrs. J. R. Robb, Mrs. L. L. Shook, Mrs. J. R. Skala, Mrs. R. F. Vermilya

The Use of Sulfonamides in the Treatment of Calf Diphtheria

JAMES FARQUHARSON, D.V.M.

Fort Collins, Colorado

IN A PREVIOUS REPORT on a limited number of cases of calf diphtheria, the prompt and proper use of sulfapyridine gave evidence of superior therapeutic effectiveness. The purpose of this paper is a statistical, clinical review of a series of 76 additional cases of calf diphtheria and to express our satisfaction to date with the continued excellent results obtained with sulfonamide therapy. The present study has been designed to compare the therapeutic results obtained by the various sulfonamides and evaluation of them in terms of the clinical and hematologic aspects and response observed.

The incidence of calf diphtheria is definitely increasing throughout the Rocky Mountain region. It is fortunate that today, when conservation of livestock is so vital to our national defense, we have at our disposal chemotherapeutic agents that have reduced to practically nil the losses from an infection that formerly caused a mortality of 90 per cent.

In a previous report our study was confined to only eight cases of calf diphtheria treated with sulfapyridine. The response to treatment was so prompt and dramatic that the possibility of spontaneous remission was ruled out. Due to the small number of cases, it was desirable that more extensive and carefully planned studies be made so that results could be more accurately evaluated. It is indeed unfortunate that today, owing to lack of statistical data, the veterinarian has to base many of his conclusions from mental calculations. Therefore, the disease was recognized by actual identification of the lesion in the larynx and recording the blood picture in a sufficient number of cases to base an impartial opinion.

Calf diphtheria, as referred to in this paper, is limited to the diseases of the larynx caused by *Actinomyces necrophorus*. The use of the word "calf" is somewhat misleading in that the disease is encountered frequently in yearlings and it is not uncommon

in 2-year olds. Very young calves, of course, are also susceptible.

Calf diphtheria is rapid in onset. The animals will manifest acute dyspnea, mouth breathing with some roaring and a painful, suppressed cough. Upon exercise, they become severely choked and panicky for air.

In a fair portion of the cases, there may be a slight discharge from the nose containing small flakes of the characteristic, grayish-like material derived from the lesions. Edema is found in the submaxillary space and aggravated, stertorous sounds will be heard over the laryngeal area, whereas there will be an absence of pulmonary involvement.

Examination with the aid of a speculum reveals a typically fetid breath and illumination of the larynx a characteristic, grayish material. This necrotic material appears to originate in the vicinity of the vocal cords and as the necrosis spreads the accumulated material tends to block off the larynx and thus interfere with respiration. The destruction in a severe case is shown in figure 1. There are reasons to believe that those who have had little experience with the condition may have diagnosed it as edema of the glottis.

There is loss of appetite and general depression and frequently the animal appears extremely toxic. If untreated, the animal usually lives from three to five days apparently dying from exhaustion and asphyxiation. The temperature remains elevated and may be slightly higher at death. The mouth is usually free of lesions, but they may be found following traumatic injury inflicted during an examination.

Feeder cattle are most commonly affected with calf diphtheria. They have been raised under range or semirange conditions, with the result that they are more or less wild and difficult to handle, unless there is a chute on the premises. A well-built chute is of great value to any organization feeding western cattle. The restraint of such

animals is a problem, because dissipating the physical and nervous energy of the animals is neither conducive to a desirable therapeutic response nor a favorable prognosis. The less handling this class of animal is subjected to, the better. Cognizant of these facts, the most logical and practical form of therapy is intravenous rather than repeated oral administration of an agent.

SULFANILAMIDE

Previous to the introduction of sulfapyridine, 8 animals suffering from calf diphtheria were treated with sulfanilamide. This was done to determine its

lapse occurred on the sixth day and although treatment was again instituted, death occurred on the seventh day. The mortality was 37 per cent in this group.

Recently a number of cases of calf diphtheria were reported on a certain ranch. On consultation, two bulls were examined. One had been treated with sulfanilamide for seven days and died. The other had received sulfathiazole for four days and recovery was complete. This is one of many instances which demonstrate the therapeutic ineffectiveness of sulfanilamide in comparison to that obtained with either sulfapyridine or sulfathiazole.

Fig. 1—This photograph shows the tongue and tissues surrounding the larynx and pharynx. In this case the infection has destroyed the base of the tongue and some of the pharyngeal tissue.



therapeutic value in necrophorous infections because of the failure of formerly approved methods of treatment. Animals treated received 1 grain of sulfanilamide, orally, per lb. of body weight. Instead of giving one large dose daily, the accepted procedure was followed in giving it in split doses every 6 hours. Of 8 animals so treated, 4 made complete recoveries, the time varying from 5 to 20 days following the initial dose, the average being 8 days. One steer was sent to market on the fourteenth day because of continued dyspnea. From our past experience, it is reasonable to assume that complete recovery might have ensued, had this animal been re-treated. Of the three deaths, one occurred during the night following the initial treatment given early in the evening. Another failing to respond to daily treatment, died on the fifth day. Autopsy revealed extensive laryngeal lesions. In the third animal, a favorable response caused the owner to withhold treatment after two days. A re-

SULFAPYRIDINE

Since our original report on the use of sulfapyridine in calf diphtheria, 52 animals have been treated with this agent. The original method adopted consisted of the administration of an initial dose of sulfapyridine sodium, intravenously, on a basis of 45 grains (3 Gm.) per 100 lb. of body weight. This was supported generally by continued oral administration of the drug for several days on a basis of 1 grain per lb. of body weight every 24 hours for 3 days. Following the third day the dosage was reduced to one-half. Most of the animals so treated were hospitalized. This method was tedious and one could not rely on the owner carrying out treatment as prescribed. Certain modifications have been inaugurated which have materially simplified the methods of treatment and yet brought about satisfactory therapeutic results.

In the majority of cases, recovery resulted from one treatment of a 5 per cent

solution of sulfapyridine sodium. The recommended dose is 45 grains (3 Gm.) per 100 lb. of body weight. The usual requirements of skill and the precautions for administration of the sodium salts are prerequisite to their use. As the sodium salts are highly alkaline, care should be taken that the solution does not escape into the peri-vascular tissues and cause necrosis and sloughing. Intravenous medication may be supported, simultaneously, with oral administration of 1 grain per lb. of body weight for 2 or 3 days, or repeating parenteral administration in 24 hours. This is more important in hyper-acute cases and in valuable animals, as it tends to prevent a relapse. However, from the standpoint of practicality and economy in the average case, it has been found expedient to give one dose of the drug, intravenously, and warn the owner to be on guard for recurrence. In such an event, treatment is repeated. When oral administration is resorted to, the dose is 1 grain per lb. of body weight, daily, in single or divided dosage.

Of 52 animals treated with sulfapyridine, 38 were given a single dose of sulfapyridine sodium, intravenously. Of this group, 11 animals (29%) had a relapse. Subsequent treatment resulted in complete recoveries in all instances, the average time of recovery being 5.1 days.

Another group of 9 animals received sulfapyridine sodium, intravenously, as an initial dose which was supported with oral administration of sulfapyridine for 2 to 3 days. There were no relapses and the average time of recovery was 4.1 days. This group clearly demonstrated the advisability of supportive treatment because most of these were hyperacute cases or valuable breeding animals, yet complete recoveries were evidenced in the shortest time.

Three additional animals which showed hyperacute symptoms received sulfapyridine sodium intravenously, daily, for two to four days. One animal died on the third day, the cause of death being due to irreparable damage to the pharynx and larynx with the use of the stomach tube in the hands of the owner, who had mistaken the condition for choke.

The remaining two animals were treated

with sulfapyridine, orally, and made uneventful recoveries in five days.

SULFATHIAZOLE

In an effort to determine the therapeutic effectiveness of sulfathiazole in calf diphtheria, 16 animals were treated with this drug, 14 of which received a single dose of sulfathiazole sodium, intravenously. The size of the dose was 3 Gm. per 100 lb. of body weight in a 5 per cent solution. There were 7 relapses (50%), and the average recovery time was 6.2 days.

Two animals received sulfathiazole sodium, intravenously, as an initial dose which was supported with oral administration of the drug for 2 to 3 days. In neither instance was there a relapse but the recovery time was 7 days. Had more animals been treated by this method, the average recovery time would, undoubtedly, have been reduced.

Blood Levels.—There is considerable individual variation in the blood levels recorded with each of the sulfonamides in question. Also, there is a noticeable difference on the part of the bovine species in the absorption and excretion of the various sulfonamides. Using the same standard dosage in all three drugs, the blood levels are highest in sulfanilamide and sulfapyridine therapy, and lowest in sulfathiazole.

Oral administration of sulfanilamide in divided doses brings about a gradual building up of the blood concentration varying from 36 to 48 hours until a state of sulfanilamide balance is established. This will vary between 4.5 to 8.0 mg. per cent. It is desirable to build up the blood concentration as rapidly as possible which can be accomplished by a large initial dose, supported by divided dosage for several days. With discontinuance of sulfanilamide therapy, most of the drug is excreted within 48 hours.

Intravenous administration of sulfapyridine sodium immediately establishes a therapeutically effective blood level of approximately 3.8 to 7.5 mg. per cent. If not supported with oral administration, this concentration drops rapidly after the first hour until only traces are observed between 20 and 28 hours. When supported with oral

A Comparison of the Sulfonamides in the Treatment of Calf Diphtheria

No. OF CASES	DRUG	METHOD OF ADMINISTRATION	AVERAGE DOSE	AVERAGE NO. DOSES	IMPROVEMENT TIME	No. CASES RELAPSE	AVERAGE RE-LAPSE TIME	SUBSEQUENT TREATMENT		RECOVERY RESULTS		
								AV. DOSE	AV. NO. DOSES	No. CASES	PER CENT	AV. TIME APPROX.
8	Sulfanilamide	Oral	Gm 100 lbs. 1.63	12.2	Hrs. 22.5	2	Days 5.5	Gm 100 1.63	10	5	63	Days 8
38	Sulfapyridine Sod.	Single iv	3.0	1	24	11	5.8	3	1	38	100	5.1
9	Sulfapyridine Sod. and Sulfapyridine	iv Oral	3.0 1.63	1 5.3	24	0				9	100	4.1
14	Sulfathiazole Sod.	iv	3.0	1	24	7	6	3.0 iv 1.63 or	1	14	100	6.2
2	Sulfathiazole Sod. and Sulfathiazole	iv Oral	3.15 1.63	1 10	24					2	100	7
3	Sulfapyridine Sod.	iv Multiple	3.0	2.6	30					3	67	5
2	Sulfapyridine	Oral	6.5	10	33					2	100	5

iv, intravenously.
or, orally.

administration, a blood concentration is maintained that varies between 4.0 to 8.0 mg. per cent on the average. Such a concentration is considered highly effective. Perusal of records tend to demonstrate that sulfapyridine is slower in absorption and in elimination than in the case of sulfanilamide.

The parenteral use of sulfathiazole sodium is associated with lower blood levels than in the case of sulfapyridine. The time of elimination is also shorter, which may account for the higher evidence of relapses. Oral therapy does not maintain nor sustain as high blood levels as either sulfanilamide or sulfapyridine.

In general, blood concentrations are dependent on the initial dosage, method of administration, fluid intake, renal function and individual variation. Variations in absorption and excretion of these agents can possibly be ascribed to a number of factors. The fluid intake is naturally reduced and the affected animal is always dehydrated which leads to higher blood levels than in the animal in which the fluid intake is normal. Impairment of renal function will cause the establishment of higher concentrations. The compound stomach of the bovine undoubtedly causes, at times, delayed and erratic absorption.

It is difficult to state what constitutes an

effective blood concentration for these various chemotherapeutic agents. However, clinical results demonstrate that they should not fall below 3.5 mg. per cent. It may not be prudent to outline a dose table to suit the individual needs of the animal. However, blood level determinations demonstrate that concentrations are therapeutically effective when oral administration is 1 grain per lb. of body weight every 24 hours, or 45 grains (3 Gm.) of the sodium salt by parenteral use.

Toxic Manifestations.—While no attempt will be made to discuss in detail changes in the blood picture, it is essential that a few observations should be mentioned in order to facilitate a clearer understanding of the subject. Calf diphtheria, like most infectious diseases, produces leukocytosis. The count will vary from 17,000 to 30,000 white blood cells. Sulfapyridine and sulfathiazole therapy results in a marked leukocytic reduction in 20 hours. This rapid reduction corresponds to the fall in temperature. Marked changes in the differential count have not been observed when treatment has been confined to two or three days. There is a slight tendency toward a reduction of polymorphs with an increase of lymphocytes. Mild hemolytic anemia (oligocythemia) is occasionally noted when treatment is prolonged for 5 or 6 days. Mild insignificant

leukopenia is also observed in prolonged treatment.

In one instance, marked agranulocytosis developed the second day in a young calf treated with sulfapyridine. In three other animals, a transient agranulocytosis developed after 6 days. With cessation of the treatment there was a rapid return to normal. The incidence of mild cases of agranulocytosis is definitely less with the use of sulfapyridine than in sulfanilamide therapy.

The most severe toxic manifestation is that of hematuria in the steer and bull following the use of sulfapyridine. This clinical manifestation has not been observed in sulfanilamide or sulfathiazole therapy. Hematuria was observed in 3 animals, in a group of 52, after 3 days of treatment. Hematuria is either preceded or accompanied by uneasiness, kicking at the belly, switching the tail, dribbling of bloody urine, and in general the same clinical symptoms as observed in urethral calculi. This is due to the formation of acetyl sulfapyridine calculi which obstruct the ureters or urethra. When hematuria develops, the drug should be immediately withheld and fluids should be forced either by the intravenous or oral route, or both, in order to produce rapid elimination. Dermatitis is another toxic manifestation noted in a few instances where sulfanilamide therapy had been used over a number of days. This manifestation was observed in white, nonpigmented areas and only when the animal was exposed to direct sunlight. From these observations one can conclude that sulfanilamide is a photosensitizing agent. This manifestation is said to occur in sulfapyridine and sulfathiazole therapy but it was not observed in our work.

GENERAL CONCLUSIONS

The cause of calf diphtheria has been attributed to *Actinomyces necrophorus*. Although *A. necrophorus* is always present, other organisms streptococci and staphylococci, are also always present. Undoubtedly, *A. necrophorus* is the organism that causes the pronounced local and systemic reaction that, if uncontrolled, causes death.

Previous to the introduction of the sul-

fonamides, treatment consisted of every known means of combatting and eliminating the infection without success. Although spontaneous recoveries have been observed, the mortality, previous to the introduction of sulfonamide therapy, was over 90 per cent.

From our observations sulfapyridine is the drug of choice in the treatment of calf diphtheria in which *A. necrophorus* is either the primary or secondary agent. The use of sulfapyridine is attended with dramatic results. A single treatment is sufficient to cure the majority of cases. Relapses do occur in this form of medication but are not serious and complete recoveries result by retreating. All relapses that occurred in sulfapyridine therapy were in the group of animals that received a single dose. The most rational form of treatment is the administration of the drug for at least two days. This procedure maintains a sufficiently high blood concentration that appears not only to reduce but eliminate the chance of a relapse. Results occur with dramatic suddenness, and it is deemed unnecessary to continue treatment after the infection has been brought under control. This agent has proved itself to be almost a "specific" in calf diphtheria.

The initial clinical results obtained with sulfathiazole have been equally as gratifying as in the case of sulfapyridine. However, a study of the blood picture does not demonstrate the same effectiveness nor is the drop in temperature quite so marked. The higher incidence of relapses from a single dose method is objectionable which demonstrates that it is less effective against *necrophorus* infections than is sulfapyridine. Nevertheless, there were no relapses in animals treated for two to three days. The number so treated is too small to arrive at an accurate conclusion in this respect. The best that can be said is that it has been highly effective, but is less effective and is second choice to sulfapyridine.

The use of sulfanilamide is not justifiable in the light of these findings. There is little doubt that it exhibits some therapeutic effectiveness. With the distinct advantages of sulfapyridine established, or

A Scientific Assay of Agricultural Education*

A CURRENT ISSUE of *Science*—June 5, 1942—contains a monograph on some of the ways of the agricultural set-up that is worth a critical analysis by the American people. It recalls articles published at the turn of the century on the general subject of "Educating Boys off the Farm." As everyone will agree, that is precisely what the agricultural colleges have done at ever-increasing cost in terms of dollars and misguided young men, if Professor W. H. Chandler of the University of California is taken as competent authority on the subject. The monograph (*loc. cit.*) entitled "Forty Years of Helping Farmers with Knowledge" seems to qualify the author.

It is no secret that veterinarians have always looked askance at the teaching of veterinary medicine to agricultural students. The protests were based upon the grounds that:

(1) Such teaching amounts to public sanction of medical quackery for farm animals without compensatory benefit.

(2) Men sufficiently versed and trained in the medical sciences to plan and carry out disease control in farm animals are a necessity of all modern nations that hope to survive.

(3) Farmers need capable doctors to treat their sick animals and handle their animal-disease problems, in the interest of themselves and their neighbors.

As can be seen in the curriculums of the agricultural colleges, these protests have been heeded. Preventive has largely su-

*Abstracts and quotation from "Forty Years of Helping Farmers with Knowledge," by W. H. Chandler, University of California, *Science* xcv (June 5, 1942), pp. 663-667. Italics ours.

(Continued from preceding page)

even sulfathiazole, one cannot entertain the use of sulfanilamide in this disease.

In conclusion, sulfapyridine has established itself as a highly satisfactory compound and is the drug of choice in the treatment of calf diphtheria. Other veterinarians consulted concur in this opinion. Among these are H. E. Kingman, Cheyenne, Wyoming; G. S. Harshfield, Fort Collins, Colorado; and N. J. Miller, Eaton, Colorado.

perseded clinical medicine in some of them.

The veterinarians never won out entirely, but as *right* has a mighty punch they could always harass the enemy's flank enough to avoid defeat. When men higher up in public education sensed that making pseudo-doctors out of agricultural students (who didn't go back to the farm anyhow) was a strange avocation for intelligent men to pursue, new fields for the graduates were created. The expense of the agricultural educational system had to be, somehow, justified. A farm adviser for each county, "extensionists" working out of every college and, finally, a teacher of vocational agriculture in every high school throughout the country was the happy, job-making idea evolved, and all this is alleged to be fused with the Farm Bureau Federation and local selling agencies. To say that all of this was as preposterous as making quack animal doctors would not be true since everything in the system is not that much of a humbug.

Although the veterinarian's faith in the right-is-might proverb never declined, the futility of a few veterinarians trying to stop the steam roller was always realized. Let the thing take its own course and find its own level was the more sensible decision, ever ready, however, to step in to prevent disaster at the tough spots, *vide*, t.b. and tick eradication, foot-and-mouth disease, etc., etc. For a long while, the veterinarians had to run their own educational system, first with nothing but private funds and later, with the right-is-might weapon in hand, had the whole system set up right on the enemy's campus which was quite a *coup d'etat* for a small group to pull off. But the old idea that farmers must be animal doctors never died—quackery is that viable. (It cropped up recently in the Department of Justice.)

There is a difference between agricultural and veterinary-medical education. Reciprocity is lacking. The one majors on plant biology as if unaware that in the absence of exuberant animal production which only disease control can provide, there

would be little need for much of the plant life created through the admittedly brilliant work of the agrarian scientists. Agricultural colleges have flourished because veterinarians, perhaps boastfully pragmatic in subduing farm animal diseases in addition to fighting an eternal battle against the ugly monster called quackery, created the wealth that supports them. Lacking the pragmatism that Professor Chandler points out, no mention is ever made of the fact that men are not crazy enough to engage in business that does not pay, and it does not pay to raise farm animals exposed to uncontrolled diseases. Were it opportune for an outsider to remind the agricultural circle of that basic fact, its whole structure should be dumped and started anew. The farmers know it and so should organized agriculture know that messing up animal life with quackery is not sound business—not a smart way to “improve the farmers.” In short, without mastery of farm-animal diseases there would be no county agents, no extension workers, no vocational teachers, or no money to pay them. In effect, here is what Professor Chandler has to say:

In 1900, The USDA, state experiment stations, agricultural colleges and secondary schools expended \$2,500,000 for education. In 1940, \$110,000,000 was spent for the same purpose. In 1900, the teachers seemed to be exceptionally earnest. They gathered force from robustly critical audiences at farmers' meetings. What most of them taught was the result of (1) reasoning from an inadequate knowledge of plant and animal processes, (2) experiences of exceptional farmers who wrote for farm journals and (3) from data from rather poor field trials that were beginning to be published.

Soon after 1900, new teachers were taken on rapidly in the colleges and experiment stations. They were men of good personality who had completed but superficial curriculums for the bachelor's degree. Their undergraduate studies had not been intense enough to disclose their fitness. They, however, regarded themselves as practical rather than scientific. Some depended for success upon arrogant contact with influential farmers, business men, bankers, and newspapermen, many of whom became interested in the aggressive young man who had come to *improve the farmers*. Those too animated for patient study accepted industrial positions with companies which, following the first world war, expected to profit by the farmers' increased purchasing power.

THE PROPAGANDA ERA

The 10 to 15 years following 1900 may be called the *propaganda era in agricultural education*. To uplift the farmer quickly, men “who knew too much” were employed for extension activities. A teacher in one college said that his extension associate could make more discoveries in one lecture than the best scientific worker could make in a lifetime of research. The dogma of the water-conserving effect of dust mulch maintained by diligent cultivation [for example], was the subject of many a sermon. At the present time, one experiment station, in seeking support, claims to have saved the farmers of its state \$10,000,000 a year by having proved that the story of the dust mulch was not true.

By 1904, conditions were improved by higher entrance requirements, and by 1920, these better students were improving the teaching and research of the college. The extension service, however, continued to be of the *propaganda type* until its ineffectiveness or even harmfulness was discovered by representatives of the college living near to the farmers. With the establishment of county farm advisers through the passage of the Smith-Lever Act in 1914, much was said in extension central offices about salesmanship in presenting ideas to farmers. Extension offices were influenced by what seemed to be “a very flatulent pedagogy.” To some of these advisers, the farmers were pathetically dull. One of them who had been insulated from farm problems by several million tenement dwellers went to great pains to tell a convocation of county agents and extension specialists how they could improve their technique by studying the Hearst newspapers, learning to express themselves in one-syllable words. The actual problems these workers faced was not the ignorance of farmers but uncertainty that what they would say would be true. . . . *Some of these earlier county agents undervalued knowledge of crop and animal problems and overvalued smart politics: skill or imagined skill in handling farm groups.* In some sections, experience has tended to correct this evil. Being close to farmers, county agents get unpleasant reactions when their philosophy does not prove to be beneficial. [Here the author compliments the county agent who goes to specialists for information he does not possess as, for example, the employment of veterinarians in the extension service.]

Nearly all of the information that has enabled farmers to protect their crops and animals against disease, animal parasites and malnutrition, has come from the use of techniques. . . . A noted experiment station director has said that experiment stations of the world have spent millions of dollars proving that the farmers are right. Systematic knowledge of plants and animals and soils is indispensable for effective aid to farmers. Attempts at grad-

uate or undergraduate teaching without it would be a sham.

Here the author points out that there are not enough farms to go around for every boy born in the country and if the number of farms were increased to accommodate all the agricultural college graduates, the acreage would be too small to provide a living, at least the kind of living the college graduate expects for his family. And here is the tragedy! Experience and observation in this and other countries show that the more farmers there are, above the number required to farm the land well and make a respectable living, the smaller will be the total yield per farmer. The too small farm competes with the family. Money needed for farm necessities (fertilizer, seed, etc.) goes for some desperate need of the family and leads to the farming of single crops for needed cash at the expense of soil fertility. Quoting: "*Education, therefore, can not wisely be directed toward keeping more boys on the farm.*" That would actually reduce national income, for where farms are so small that three men are doing the work that two should be able to do well, the extra hand is a consumer, not a producer.

Teaching agriculture to boys who will never farm, the author points out, *will prevent them from learning something that would be helpful to them*, and he adds that work on a farm is the only way to train for farming.

DESTINY OF THE AGRICULTURAL GRADUATE

But a small percentage of graduates of agricultural colleges become resident or extension teachers, county agents, or research workers. A considerable number obtain positions in which *they do not use any of the training received at college*. . . Those with special aptitude in certain sciences, especially chemistry, are more likely to obtain good positions.

Men who worked for the establishment of the agricultural colleges, and the early teachers expected that nearly all graduates would operate farms. Rather few have done so, long. A large percentage have not had farms large enough to earn a living, and wages for working on farms are not high enough to permit the accumulation of capital. Furthermore, *no kind of college training can compete with farm experience and observation in one's own community.*

The disappointment at the rather small number of agricultural college graduates who went back to the farm was perhaps the reason, in some states, for the establishment of secondary agricultural schools and a system of high schools training in agricultural subjects throughout the country.

THE HIGH SCHOOL IDEA

Over \$15,000,000 are expended annually on vocational agriculture in the high schools. In this project, the author asserts from personal observation that the teachers have been trained for teaching, not for agricultural technics, and that their associates on the high school staffs are men not trained to evaluate the knowledge of crop, soil and animal problems. Under these circumstances, the high school boy (and we quote) "*receives too much pedagogy, too little truth, and too much propaganda,*" and he is taught to expect too much from the courses he receives when he gets into competition with experienced farmers. Although that some succeed in raising and selling breeding stock because of the advertising the project gives them, is admitted. What is needed, the author declares, is a survey of high school classes to see how many have benefitted and how many have been led to failure—perhaps after they have families. The Smith-Hughes teachers are further taken to task for their anxiety to have large classes and thus handicap students who go on to college lacking the basic training they sacrificed in their futile attempt to learn theoretical farming. "If such a student enters an agricultural college that permits him to take applied courses he is apt to face life at graduation without the opportunity for employment at any work that requires a technique, probably without money enough to start farming, without experience enough in any basic field to know whether he is suitable for graduate work, and with so little basic training that four or five years of graduate work would be required to prepare him for teaching or research." . . .

The author emphasized that in the Smith-Hughes system too many grave, economic decisions are made for the student from pedagogic data and dogmas. "The teacher

who urges a boy to farm is making an economic decision for him which should be left for men informed on the agricultural outlook," the article warns, "since developing aptitudes for basic fields or for special trades would be better than to choose a boy's lifework for him."

The high note of the article is reached when the author recalls that "pompous high priests" of the schools systems have said:

Any community that lets its young men get away from it is a dead community.

The only place to keep them in a community is on the farm.

But professor Chandler thinks that a better brand of advice would be "Blessed are the meek for they will not mislead their brothers with poorly considered teaching or strutting shams." In closing, Chandler adds:

"Rarely does the God of Nature reveal His laws to the propagandist or the pompous or even to the merely zealous but rather to him who trains diligently in the techniques and records of a system of knowledge. . . ."

We commit this treatment of agricultural education to the thoughtful analysis of all men, for it appears to be an authoritative confession, published in an unbiased journal of science, that in this agricultural country of ours, now fighting for survival, the world's greatest industry — farming — has fallen for management into hands who succeeded in building up a gigantic political machine at tremendous cost that not only deceives its sponsors but actually lures young men into years of futile college work on the false notion that they are being trained to be "The Future Farmers of America." As a matter of fact, they are forever lost to the farm, except for the few needed in a pedagogic capacity to maintain the continuity of a vicious trend far removed from the original purpose of promoting research on plant and animal problems for the people's benefit.

There is no intention, here, to convey the impression that the article is an antemortem inquest on the agricultural colleges since the author's obvious purpose was to

tell the truth for the benefit of the conditions assayed—to propose reforms in a component of the public education which he finds is shutting its eyes with tongue in cheek to "propaganda" that the people may not forever endure, deified as that manner of helping farmers has been in the public mind. It's dangerous to get drunk with success.

It is disappointing that veterinary quackery *per se* is not singled out as further proof of the author's contention. Here was the chance to clinch the argument. That omission appears to be significant evidence that the science of medicine for the farmers' animals has not been weighed in the upper echelon of American agriculture. Or, does it signify that medical quackery for domestic animals is too sinister to bring out in open debate? Veterinarians believe there is no lack of propaganda here.

No general principle of medicine since Hippocrates has been discarded; only methods in technics have changed. The change from dais to laboratory for teaching veterinary medicine in the agricultural college has not changed the principles the veterinarians defend. The presence of the medically trained mind in the presence of the sick is a setting no group of exploiters can ever hope to supersede. Man's no fool and in our perspective we have not found farmers "pathetically dull." They are only outsmarted.

The first systematic study of hog cholera in this country was made by H. J. Detmers at Dixon, Ill., in 1878 and 1879 under the direction of U. S. Commissioner of Agriculture Wm. E. Le Duc. An experiment station was set up at Gap Grove, six miles west of Dixon, to carry out the investigation. Gap Grove was described in the report as "the center of an infected district." H. J. Detmers is credited in American veterinary history also as the founder of veterinary education at Ames, Iowa, and Columbus, Ohio, where the colleges he inspired continue to flourish.

Will the Japs change the complexion, physiognomy, and physique of the world we know? Fall in and write the answer.

The Veterinary Profession and the AVMA

H. W. JAKEMAN, V.M.D.

Boston, Mass.

OWING TO THE HARROWING war into which this country has been forced, every American citizen is pledged to aid in every way possible to win the conflict. Buying bonds and stamps, conserving material, keeping up morale, carrying on as patriots, and contributing actively to military and civilian needs are duties of paramount importance which all of us are willingly accepting in this hour of grave national emergency. While these are privileges and obligations common to all, we as veterinarians, belong to a profession which has a vital part to play. Our responsibility is twofold, as it will increase as the war progresses and will remain long after peace has been attained. As our secretary of agriculture has said, "Food will win the war and write the peace." Since the significance of food of animal sources can not be overestimated, the authorities recognize the need of increasing the protection of farm animals against losses from disease. In this connection, the veterinary profession has been "put on the spot" by the government and, perhaps, our task is greater than many of us realize. It has been said that the United States and Canada are the safest places in the world for livestock. The eradication of bovine tuberculosis, Texas fever, foot-and-mouth disease, contagious pleuropneumonia and other destructive diseases of livestock are achievements for which the veterinary profession is proud. The vigilance employed in keeping out exotic animal plagues, together with the continuous programs against domestic contagions to which farm animals are constantly exposed, have been important factors in American development.

But let us consider for a moment another side of the picture. Figures released by one of the government bureaus in Wash-

ington show the following losses from animal diseases in the United States during 1941:

Tick Fever	\$ 400,000
Hog Cholera	12,500,000
Cattle and Sheep Scabies.....	1,000,000
Anthrax	750,000
Tuberculosis (cattle, swine and poultry)	10,500,000
Bang's Disease	30,000,000
Parasitic Diseases	125,000,000
Screw Worms	5,000,000
Poultry (except parasites and tuberculosis)	40,000,000
Rabies	250,000
Encephalomyelitis	11,000,000
Johne's Disease	500,000
Hemorrhagic Septicemia.....	500,000
Anaplasmosis	100,000
Swine Erysipelas	1,000,000
Swine Abortion	10,000,000
Mastitis	19,000,000
Pericarditis	350,000
Abscessed Livers	1,000,000
<hr/>	
\$268,850,000	

These figures present in part the problem which the veterinary profession faces. It is not an easy one to solve as successful solution is influenced by factors beyond the control of veterinary science. Material reduction of these losses, however, can be effected by systematic attack of which I shall speak later.

In view of the situation facing the veterinary profession, it seems opportune and necessary to take stock of ourselves, collectively and individually. The status of the veterinary profession as a national unit eventually establishes its rating in a city, community, state or region. It, therefore, governs the standing of the individual member. Let us look at the national picture frankly and from a broad view.

It can be asserted without reservation that the advancement of the veterinary profession to its present status was derived from the organized effort made by the American Veterinary Medical Association. Few of us would be here today but for the

Address delivered before the Northwest Veterinary Medical Association, Seattle, Wash., July 6-8, 1942, as president of the American Veterinary Medical Association.

small group who founded the Association in 1863. Through the succeeding 79 years, the destiny of the profession and its service to the nation and mankind was molded. It has established a professional and social heritage for the veterinarian that places him and his family on the same starting level as that of the other learned groups. The AVMA is international, representing not only the United States and Canada, but also Cuba, Mexico and other American Republics. While the membership has reached the all-time high of over 7,000, it should have 12,000 and we believe that figure will be reached in the not distant future. It is not possible here to enumerate all of the things the Association has done in guiding the profession to its present level in service and standing. Its accomplishments are based upon two fundamental policies, namely:

- 1) The advancement of professional knowledge through education and research.
- 2) The application of professional knowledge through properly trained men and in obedience to the approved ethics of medical practice.

The influence of these two all-embracing fundamentals can not be questioned, for, in contributing to advancement through support of them, veterinarians in all fields have figured prominently; although it is regrettable that some have had to be carried along with the advance, free of charge. Practitioners have done their share not only by active membership and support of the associations but also by their work and contacts; by keeping pace with scientific developments; by taking an interest in community affairs; by coöperating with their colleagues; and by deporting themselves as men of responsibility and training. In recent years, small animal practitioners have done much to improve the techniques of practice and to increase public respect for the profession. Their modern surgical and medical methods with classical equipment, in many cases surpassing that of the physician, has done more than any other single factor in obtaining professional recognition, especially from women and men who know nothing about veterinary work on the farm. The invention and work

of a general practitioner in the field of fractures has attracted attention and received the enthusiastic praise of the medical profession. His apparatus has replaced previous methods of handling certain types of fractures in human beings and he has applied his method for the instruction of prominent orthopedic surgeons in the United States Navy, and in civilian practice. This invention has brought credit to the veterinary profession.

The following can be listed among the more recent accomplishments of the Association:

- 1) Increased unity of effort.
- 2) The maintenance of a nation-wide publicity program on the standards and significance of modern veterinary science which is carried out through newspapers, magazines, and radio.
- 3) Obtaining official consideration for veterinary students and practitioners so that civilian and military needs may be met.
- 4) Obtaining priorities for veterinary supplies for manufacturers.
- 5) Establishing recognition and connections for our literature in biological and medical fields, e.g. *Biological Abstracts* and *Cumulative Index Medicus*.
- 6) Obtaining veterinary representation on the Committee on Revision of the United States Pharmacopoeia.
- 7) Bringing government and public attention to the importance of veterinary medicine in the national preparedness effort as applied to military and civilian duties, through the conservation of food-producing animals and the protection of human health and welfare. Had this not been accomplished, the veterinary profession would not have been given recognition on the Procurement and Assignment Service for physicians, dentists and veterinarians which was appointed by the President last year.
- 8) Establishing the American Journal of Veterinary Research, through the efficient work of the editorial staff.
- 9) Founding a program for the furtherance of veterinary research with added opportunities for veterinarians to enter the field of investigation.
- 10) Presenting an AVMA program for increased egg production to meet the present emergency. This program has been enthusiastically received by government officials, extension workers and others.

While there are other achievements to be enumerated, these suffice to indicate the significant results obtained by virtue of organized effort. I would like to emphasize

that the accomplishments so briefly told and others are not mere fortuities. They represent a great deal of effort, time, and personal sacrifice on the part of those who have been interested in the welfare and advancement of the veterinary profession.

In passing, may I draw attention to the work of the Association's committees. Most of these, being active throughout the year, contribute greatly to the crystalization of knowledge. Reports submitted are informative and reliable. Often, they shape the policies and otherwise chart the profession's course. These reports should be studied by everyone. (See, for example, the report of the Committee on Poultry and "Poultry Information Please" pamphlet.) There are reasons to be proud of the achievements and advancements of the veterinary profession. But if we permit ourselves to feel satisfied, we are doomed. "A man's reach must exceed his grasp, or what's a heaven for?"

The AVMA has been undergoing reorganization during the past five years which we believe has increased efficiency, interest, and enthusiasm on the part of veterinarians and is really doing things for the betterment of the profession and each individual veterinarian. There are many more things facing the profession which *should* be done and many of them *would* be done if funds were available.

There has been considerable difficulty in balancing the budget for several years. The Association's fixed expenses have increased and while the membership has increased also, the amount of money derived from membership fees has not been sufficient to take care of the outlay. Perhaps, few realize that the income of \$5.00 a year per member actually nets the Association but 52 cents per member. In other words, its costs \$4.48 per member for the 12 issues of the Journal. The income from advertising in addition to the small membership fee constitutes the main source of revenue.

The present staff at the central office consists of eight efficient and extremely busy individuals. As a matter of fact, additional help could be used to great advantage, especially at this time when so

much work is being done in behalf of the whole veterinary personnel of the country.

There are certain trends and situations which require careful consideration by the veterinary profession. In listing a few of these, I wish to stress that observations are on a national scale and that some of them may not apply alike in all of the states, but as pointed out previously, matters affecting veterinarians in one state may eventually affect the others. These are not presented as criticisms nor with the idea of providing solutions but rather to show the ever-existing need of organized effort in order that we may retain our rightful professional status. It should be said first that the profession has been suffering from what might be called growing pains. Our growth has been rapid and there has been noticeable failure in many ways to fit into the picture of medical and agricultural science. In many instances, the attitude has been one of indifference and independence—often cynicism—toward other groups concerned with farm animals and one or another phase of animal disease control. Recognition of, interest in, and coöperation with allied groups are essential to advancement and to maintaining the rightful place of the veterinary profession among the other science groups. The following trends, therefore, are not without some degree of logical explanation:

1) *Federal and state regulation as they affect the practitioner*—The Association is making a survey to determine the areas where the veterinary service is not adequate or where none exists, and in addition, steps are being taken to have practitioners given more recognition and work in connection with federal and state projects.

3) *The development of local meat and milk inspection*.—Veterinarians have been slow to recognize the fact that special training in these and other fields of sanitary science opens splendid opportunities for part or full time work with boards of health. The trend is for this work to be carried on by others who do not have the basic training possessed by a graduate in veterinary medicine.

4) *The trend toward socialized veterinary*

medicine.—In some parts of the country, this is well under way and regardless of its desirability or its objectionable features, the subject deserves considerable study and thought so that if the departure is here to stay, it will at least remain under the guidance of the profession.

5) *County farm advisers and their relationships to the field of veterinary medicine.*—In many sections of the country, farm advisers continue to perform minor operations, vaccinate animals, diagnose disease, and pursue other activities of a strictly veterinary character.

6) *The development of substandard veterinary colleges which reflect unfavorably upon the country's educational system* is a current danger owing to the growing desire to enter the veterinary profession on a basis below the requirements established by the Association.

7) *The vaccination of animals by laymen* has become serious in most parts of the country and is increasing throughout the East. In the absence of professional advice and diagnosis the practice is shortsighted from the economic standpoint. It is obvious that lay vaccination of animals is not conducive to the best results and that it undermines the entire veterinary service to the detriment of the livestock industry and the nation. The proper use of veterinary science is closely linked with the development of American agriculture but, unfortunately, like so many things in life, its accomplishments are taken for granted. In spite of what the control of destructive diseases of farm animals has meant to American farmers in terms of money saved and in food supplied to the people, the veterinary profession has not been accorded the credit deserved. Coupled with the expansion of lay vaccination is the movement to have drug stores sell veterinary pharmaceutical and biological supplies for home use. The plan appeals to those druggists who do not realize that they thus become a factor in the encouragement of quackery. However, since it has been and probably always will be possible for animal owners to obtain such

products for home use, it is hoped that in this time of national emergency, the prevention of losses in food production will not be too badly molested by such unwarranted meddling with weapons which are safe only in the hands of trained technicians.

The adage that the chain is no stronger than its weakest link applies. In towns, cities and states our profession is judged largely by the ability, ethics, culture, and public spirit of those who represent it. For that reason each of us having the welfare and advancement of veterinary science at heart has a responsibility to meet which extends far beyond ourselves and dependents. It is natural for any person to belittle the part he plays in his profession but that attitude should not prevail. As pennies make dollars so do individuals make a profession. We should, therefore, make self-analyses from time to time in order to develop the will to overcome weaknesses and avoid getting into ruts or doing unprofessional things. We might ask ourselves the following questions:

1) Have I contributed all that I should toward the betterment of my profession?

2) Am I conducting myself as a professional man by employing the classical methods the quack can not imitate?

3) Am I charging a reasonable professional fee for my services comparable to those of my colleagues?

4) Am I keeping in touch with the developments brought out in the literature and association programs so that I may be qualified to render up-to-date service?

5) Am I guilty of lowering public appraisal of my profession by criticizing the professional work of my colleagues, especially in agreeing with trouble-making clients?

6) Have I tried to live up to the code of ethics of the veterinary associations?

Above is a brief sketch pointing out the influence of the national association through organized effort; a few trends of situations proposed for study and action; and the need of making a survey of the whole profession and ourselves, individually. To this I would like to add some of the present activities of the Association:

The Procurement and Assignment Service has taken much time and effort of both

the national and state associations in recent months, and this responsible work must be carried on with care by all who are serving on the various committees. Credit and appreciation is due to veterinarians all over the country who have given their time and energies to the duties of corps area and state veterinary preparedness committees. It is our job to see that the military and civilian needs for veterinary services are met fairly and fully. In this work of procurement and assignment, the American Veterinary Medical Association and the constituent state associations have been designated as the official spokesmen for the entire veterinary profession, not simply our members. The trust placed in our organization by the government must be and I know, is justified. The recognition which our work with the medical and dental professions has brought to us demonstrates unmistakably the support that every qualified veterinarian owes to the national and state associations.

It has been recognized in AVMA councils that greater effort should be made to establish closer contact with other professional groups interested in problems related to veterinary science. The Procurement and Assignment Service has aided instrumentally in respect to medical and dental relationships. At the present time, a movement is under way to cooperate with the following national associations:

The United States Live Stock Sanitary Association.

The American Society of Animal Production.

The Poultry Science Association.

The American Dairy Association.

A program of education and research, coöperatively conceived, for improving productive efficiency and disease-control measures is being outlined. This movement brings together veterinarians, biochemists in nutrition, animal husbandmen, and others—a decidedly forward step.

The research program of the Association has not progressed as rapidly as it would have under normal conditions. However, a great deal has been accomplished and everything is now in readiness for establishing fellowships. Several of these will

be in operation soon and more will follow in the near future. This program will produce more research workers and outstanding specialists. It will increase the veterinarian's prestige.

During the year a committee on nutrition has been appointed. This committee will promulgate a plan at the Chicago meeting for intensifying efforts to standardize available information on this extremely important but somewhat neglected study in veterinary medicine. You have probably noted that an amendment to the by-laws will be acted upon at Chicago providing for a permanent or standing committee on animal nutrition.

Other amendments have been published in the JOURNAL. One of these provides for each constituent association to nominate one of its members as the resident state secretary. I have no doubt that it will be adopted and if it is, this will be another step forward in strengthening the democratic workings of your national veterinary organization. Before closing I would like to say just a few words about the AVMA as an organization and mention a few reasons why every veterinarian who is eligible should be a member. It would be difficult to conceive of a more democratic set-up. Each member has a voice and the majority vote rules. The increased interest in elections of district representatives on the Executive Board, the greater care shown in choosing members of the House of Representatives, and in the deliberations of the House, indicate what the Association stands for and that it operates to the advantage of *all* members of the veterinary profession. With the type of young men (and women) entering the profession under the advanced educational requirements and with practically 100 per cent of the graduates of each college year joining the AVMA, one sees the future of organized veterinary medicine going into right hands for administration and scientific advancement. As aptly stated by a past president, "No profession, no matter how large, can really be powerful without unity and in a small profession unity is one of the essentials of existence." We should strive, therefore, to set aside petty differences,

rivalries, and jealousies and remember that we have a common fundamental objective—the welfare and advancement of our profession. At the present time as never before, the American Veterinary Medical Association represents the veterinarians of this country in the government circle and among the general population. It has been called upon to perform important duties, which means additional expense. It, therefore, needs the support of every qualified veterinarian in the United States and Canada who is not now a member. It is a patriotic duty to aid in the organized efforts of the profession to which we belong.

Former American Veterinary Officer Honored

When Dr. A. W. Whitehouse was chosen president of the Royal College of Veteri-

nary Surgeons, June 3, 1942, the Council conferred upon a former American veterinary officer, the highest honor a veterinarian can receive in Great Britain and far beyond. Dr. Whitehouse is an alumnus of Ontario and Colorado State who joined the Veterinary Corps, U. S. Army *via* the National Guard of Colorado in 1917. After short stretches of duty at Camp Greene, N. C., and Newport News, Va., he was sent overseas to serve in the A.E.F. in France. At the close of the war, he established himself in his native country—Scotland—where after receiving his master's degree at Oxon, he was made principal of the Glasgow Veterinary College, a position he still holds. Dr. Whitehouse is an honored member of the AVMA, whence goes the greeting of his American colleagues and their hearty congratulations.

The Grand Ballroom of the Palmer House, Chicago



Tests with Nicotinic Acid for the Prevention of Infectious Swine Enteritis

B. H. EDGINGTON, D.V.M., W. L. ROBISON,
M.S., WISE BURROUGHS, Ph.D., and R. M. BETHKE, Ph.D.

Reynoldsburg, Ohio

THE RELATIONSHIP of nutrition to disease in man and animals has been a subject of investigation for many years. Conclusive evidence exists to show that an absence or insufficiency of certain essential nutrients from the diet causes the development of specific disease conditions, such as rickets, pellagra, anemia, etc. In other instances, the disease development may be less specific although the dietary deficiencies appear to render the animal more vulnerable to some infections and to the development of evidence of functional disturbances.

Much impetus has been given these lines of investigation through the discovery of the importance of vitamins and certain "trace elements" in the problems of nutrition and their relationship to the maintenance of health.

When first discovered, vitamin B was considered to be an entity. Later research has shown that this vitamin is composed of several distinct factors, one of which is nicotinic acid.

The importance of this acid in the treatment of pellagra in man has been demonstrated by Spies and associates (1938), while Birch *et al.* (1937) have reported the occurrence of an enteritis in pigs fed a pellagra producing ration. A. D. McEwen (1937) also observed an enteritis not associated with *Salmonella choleraesuis* infection, the microorganisms generally considered to be an active factor in swine enteritis, in pigs on a ration low in nicotinic acid. Fairbanks and Curzon (1939) state that "If nicotinic acid is not supplied in the diet of the pig, severe and typical symptoms of deficiency develop which may be promptly cured by administration of the acid." Later (1940) they conclude that

"Nicotinic acid deficiency may appear in pigs raised on the farm, and hence care should be taken in choosing a ration for pigs to insure its presence." Davis, Freeman and Madsen (1940) observed, in investigations which were designed primarily to study the effect of single grains on the distribution of fat and lean in pork carcasses, that many of the pigs on some of the rations, especially corn, developed digestive and other disturbances and on autopsy revealed lesions considered characteristic of necrotic enteritis, whereas failure to develop these conditions was noted in pigs receiving certain other rations. Since they were fed differently, though kept in the same enclosure, all were thought to have had the same exposure to disease.

Discussing their results these investigators state, "The authors' results indicate that the organism was present and that necrotic enteritis was prevented and cured by the use of nicotinic acid as a supplement. Definite demonstration that nicotinic acid will prevent the development of necrotic enteritis in swine even in the presence or a massive infection of *S. choleraesuis* must await the feeding of cultures of this organism along with supplements of nicotinic acid."

Later, Davis, Freeman and Madsen (*loc. cit.*) reported the results they obtained by using nicotinic acid, fresh beef liver and dried baker's yeast as supplements to the basal ration. Infection of the pigs in these experiments was undertaken by oral administration of meat infusion broth cultures of *S. choleraesuis*. All culture-fed pigs were said to have shown temperature reactions but there was a marked difference in the development of necrotic enteritis. The best results were claimed for the liver supplement. Some protection was afforded

From the Animal Disease Laboratory, Ohio Agricultural Experiment Station.

by the nicotinic acid but none was credited to the yeast as used.

The authors postulate that "The protective action of these supplements is by maintaining the nutrition of the pig rather than a specific action against the *S. choleraesuis* organism."

Realizing the need of a preventive or cure for necrotic enteritis in swine, the Ohio Agricultural Experiment Station in 1939 started a series of tests with the object of obtaining further information as to the value of nicotinic acid as a preventive of swine enteritis due to *S. choleraesuis* infection.

The ration A used in these experiments was considered as being low in nicotinic acid but adequate in other nutrients. It consisted of:

	Per Cent
Ground Yellow Corn.....	76.5
Soybean Oil Meal (44% solvent). .	20.0
Minerals*	3.0
Cod Liver Oil (85 D units).....	0.5

The ration was fed twice daily in amounts that were readily eaten by the pigs.

The nicotinic acid (Merck U. S. P.) was administered, in the first three experiments, in capsules to the individual pigs. This method of administration was selected to insure a known acid intake of the pig irrespective of its feed consumption. In experiment 4, the nicotinic acid was dissolved in water and the required amount mixed with the morning feed. Whenever a pig refused feed the acid was given in a capsule.

The amount of nicotinic acid given per pig daily ranged from 100 to 300 milligrams in the different tests. The selection of these levels was somewhat arbitrary. In view of the results reported by Geo. K. Davis *et al.* (1940) it was felt that the minimum amount was sufficient to cover ordinary requirements, and that the maximum dosage would not prove toxic to the animals.

Infection was attempted by feeding definite amounts of cultures of *S. choleraesuis*. The cultures were 24-hour bouillon growths

of the organism. These were mixed with a small amount of the ration and fed to the pigs individually. The strain of *S. choleraesuis* used had been isolated at this station from an infected pig and was known to possess a virulence capable of producing a definite morbidity in the majority of pigs to which it was fed. Varying amounts of the cultures were fed in an attempt to provide a somewhat graded degree of exposure. In a few instances, exposure was made by pen association of susceptible pigs with experimentally infected swine.

Usually the pigs were maintained on their respective rations for approximately two weeks before the cultures were fed. The pigs were housed in concrete floored pens that were kept bedded with wheat straw. The pens were kept reasonably clean, although rigid sanitation was intentionally avoided in an attempt to intensify the opportunity for infection.

The pigs were grouped into two lots: One received only the basal ration, the other nicotinic acid in addition to the basal ration. In this report, unless otherwise stated, they are designated as "control" and "nicotinic acid" groups, respectively. The groups were so selected that each contained a comparable number of pigs of similar weight and general thrift. The majority of pigs were from the Station's herd, although a few litters were obtained from other sources.

Postmortem examinations were made on all pigs that died or were killed on account of unthriftiness. Evidence of enteritis was observed in all cases. Bacteriological examinations to recover the infecting organism were made on a majority of these pigs and *S. choleraesuis* was regularly recovered.

Experiment 1.—Eleven pigs ranging from 44-65 lb. in weight were used in this test conducted in January 1940. The animals were separated into a control group of 5 pigs and a nicotinic acid group of 6 pigs. No preliminary period of feeding before exposure to infection was undertaken in this test. In addition to their ration the pigs in the nicotinic acid group received 100 mg. of the acid per pig daily throughout the test. The acid administration began one day before exposure.

Three pigs of the control group were fed 50 cc., 100 cc. and 200 cc. of *S. choleraesuis* cul-

*Bone Meal, 2 parts; ground limestone, 2; salt, 1.

ture, respectively. Four pigs of the nicotinic acid group were fed cultures. Two received 50 cc. each, one 100 cc. and one 200 cc. of the cultures. Two pigs in each group received no cultures, but were retained in the pens and thereby subjected to exposure.

RESULTS

All but one of the pigs fed cultures died. This pig was in the nicotinic acid group and had been fed 50 cc. of the culture. While this pig did not die, it had a high temperature and refused feed for several days.

Only one of the four pen-exposed pigs failed to show illness. This pig was in the control group. All had apparently recovered by the thirteenth day after culture feeding at which time the test was terminated.

Experiment 2.—Forty-nine pigs farrowed at this station in the fall of 1939 were used in this test which was started in February 1940. The pigs ranged from 40 to 100 lb. in weight and were representatives from 24 litters. They were separated into control and nicotinic acid groups of 20 pigs each and an additional group of nine designated as normal controls. The latter group, after the preliminary feeding period, was removed to isolation quarters to serve as an index on the possibility of latent infection in the herd, or the development of digestive disturbances of dietary origin.

Administration of the nicotinic acid and feeding of the ration, both of which were started three weeks before cultures were fed, continued throughout the experiment.

In the control and nicotinic acid groups, eight pigs of each group were fed 30 cc., eight 50 cc. and four 100 cc. of *S. choleraesuis* culture per pig.

RESULTS

Eleven of the 20 pigs in the control group showed evidence of infection following exposure. Two of these died; the others had recovered within the 14-day period following culture feeding. Twelve of the 20 pigs receiving nicotinic acid showed evidence of infection but made uneventful recoveries before termination of the test. The normal control group of nine pigs receiving neither nicotinic acid nor cultures remained apparently healthy throughout the test.

Deaths occurred only in the control group and a larger number of pigs showed longer

periods of illness than were observed in the nicotinic acid group. However, there were more pigs showing illness in the nicotinic acid than in the control group.

Neither death nor extent of morbidity was apparently associated with the varying amounts of cultures fed.

Experiment 3.—Thirty-two spring (1940) farrowed pigs, ranging in weight from 21 to 44 lb. were used in this test. These pigs were separated into two groups of 16 pigs each. All were fed ration A. The pigs in the nicotinic acid group were given 200 mg. of nicotinic acid daily per pig, throughout the experiment. The feeding and acid administration was started two weeks prior to culture exposures. All of the pigs were retained in the same pen and lot throughout the test.

Four pigs in each of the groups received 30 cc. and four 60 cc. each of *S. choleraesuis* culture. The remaining eight pigs in each group were not fed cultures but were given the opportunity of exposure by direct association in the pen with the culture-fed animals.

RESULTS

The day following culture feeding, the majority of the culture-fed pigs were visibly sick and within three days all were sick. Six of the eight pigs fed cultures but receiving no nicotinic acid died, and one was killed on account of unthriftiness. One of the pen-exposed pigs receiving no acid died, and one was killed on account of unthriftiness. Six of the eight pigs fed culture and nicotinic acid died, and one was killed on account of unthriftiness. One of the pen-exposed pigs receiving acid died, and two were killed on account of unthriftiness.

Nine days after the cultures had been fed, another group of nine susceptible pigs were placed in the original pen as additional pen-exposure pigs. Five of these pigs received 200 mg. nicotinic acid daily per pig throughout the test. The other four received no acid. All showed evidence of illness on the fifth day after being put in the pen. This illness continued for the next 3 to 4 days, but all had apparently fully recovered within 12 days after they had been started on the test.

The conditions of this test appear to have offered an exposure to *S. choleraesuis* representing roughly three degrees of magnitude, namely: (1) those fed cultures represent-

ing a severe degree of infection; (2) those exposed by pen association beginning immediately after the others had been fed cultures, showing a less severe infection; and (3) those added later as pen-exposure pigs, representing the least severe infection. There appeared to be little if any difference in disease occurrence between the pigs that received nicotinic acid and those that did not.

Experiment 4.—Forty-eight spring (1940) farrowed pigs weighing from 31-71 lbs. were used in this test. These pigs were allotted into three groups of 16 pigs each. Eight of the pigs in each group were given 200 mg. of nicotinic acid daily per pig, the remainder receiving no acid. The nicotinic acid was dissolved in water and the required amount of the solution mixed with the morning feed.

A somewhat different ration was fed to each of the three groups: ration A, the ration as used in the other experiments, and ration B as follows:

	Per Cent
Ground yellow corn.....	39.0
Oats (ground)	39.0
Soybean oil meal (44% solvent) ..	15.5
Alfalfa (ground)	4.0
Minerals (as in ration A).....	2.0
Cod liver oil (85 Units).....	0.5

Ration C is ration A, plus the equivalent of 100 Gm. daily per pig of fresh beef liver in the form of a dried meal.

The meal was prepared by passing fresh beef liver through a sausage mill and then spreading the ground liver in layers about $\frac{3}{4}$ in. thick on metal trays. These trays were placed in a heated oven with forced air ventilation and maintained at a temperature of 105 to 120 F. The time required for drying was approximately 68 hours. The dry liver was then ground to a coarse meal for feeding.*

The pigs were fed their respective rations and nicotinic acid throughout the duration of the experiment beginning 25 days before the *S. choleraesuis* cultures were given. Of the pigs receiving the rations without nicotinic acid, four on each ration received single 25 cc. doses per pig of the culture, whereas each of the other four was given 5 cc. daily on five consecutive days. A similar feeding of cultures was followed with the pigs receiving nicotinic acid.

RESULTS

None of the pigs died during this test. Many on each ration showed sickness, as

indicated by either elevation of temperature, refusal of feed or diarrhea. Usually this illness was observed only during the first few days following culture feeding, although in a few instances the illness was prolonged into the second week. All had apparently recovered within 14 days after exposure.

The absence of deaths and the lack of severe or prolonged symptoms of illness in any of the various groups in this experiment indicate that the degree of infectivity of the cultures, as used, was not sufficient to cause grave reactions, but adequate to cause at least a mild illness in the majority of the exposed pigs. It appears fair to assume that under such conditions, protective values if present should have become readily apparent.

The uniformity with which morbidity occurred in the different groups following exposure to *S. choleraesuis*, indicates that little if any protection which could be attributed to the rations or supplement as fed under the conditions of this test was obtained.

AGGLUTINATION TESTS

Agglutination tests were made for all pigs used in the last three experiments in an effort to obtain additional information as to previous or latent choleraesuis infection in the experimental animals. Blood for these tests was collected before the pigs were started on experiment and again from those surviving at the termination of their experimental use. These routine tests were made, using a phenolized salt solution suspension of a 24 hour nutrient agar growth of *S. choleraesuis* in a final concentration approximating the No. 1 tube of the McFarland standard. The serum represented final dilutions of 1:25, 1:50, 1:100 and 1:200. The tests were incubated at 37 C. for 18 to 20 hours and allowed to stand at room temperature for about two hours before recording.

All of the pigs with the exception of five in experiment 2, showed negative reactions in the 1:25 dilution before starting on experiment. Of these exceptions, complete agglutination was observed at 1:25 in one

*The writers acknowledge the aid given by Mr. Edward A. Silver, Agricultural Research Engineer, Ohio State University, in the preparation of this meal.

TABLE 1—Summary of results following *S. choleraesuis* exposures.

RATION FED	METHOD OF S. CHOLERAESUIS EXPOSURE		NICOTINIC ACID GROUPS					CONTROL GROUPS			
			No. PIGS	NIC. ACID PER PIG DAILY	SICK 2-4 DAYS ONLY	SICK OVER 4 DAYS	DIED	No. PIGS	SICK 2-4 DAYS ONLY	SICK OVER 4 DAYS	DIED
EXPERIMENT 1											
A	Fed	50 cc.	1	100 mg.			1	1			1
		100 cc.	1				1	2	1		1
		200 cc.	1				1	1			1
	Pen		2		0	1	0	2	1	1	0
EXPERIMENT 2											
A	Fed	30 cc.	8	300 mg.	4	0	0	8	1	2	1
		50 cc.	8		5	0	0	8	0	3	0
		100 cc.	4		2	1	0	4	3	0	1
EXPERIMENT 3											
A	Fed	30 cc.	4	200 mg.	0	1	3	4	0	1	2-1 K
	Pen	60 cc.	4		0	0	3-1 K*	4	0	0	4
	Pen		8		0	5	1-2 K	8	1	5	1-1 K
	Pen	(later)	5		3	2	0	4	3	1	0
EXPERIMENT 4											
A	Fed	25 cc.	4	200 mg.	0	3	0	4	2	0	0
	Fed	5 cc.	4		2	1	0	4	3	1	0
	Daily for 5 days										
B	Fed	25 cc.	4		1	3	0	4	2	0	0
	Fed	5 cc.	4		3	0	0	4	2	0	0
	Daily for 5 days										
C	Fed	25 cc.	4		2	2	0	4	2	0	0
	Fed	5 cc.	4		4	0	0	4	2	2	0
	Daily for 5 days										
Totals			70		26	19	10-3 K	70	23	16	12-2 K

K*—Killed—very sick and greatly emaciated.

pig, at 1:50 in three and at 1:200 in one. Each of the pigs tested at the conclusion of the experiments, except two in experiment 3, gave complete agglutination at a dilution of at least 1:100. One of the two above exceptions showed complete agglutination at 1:50, the other only partial agglutination at 1:25. Both of these pigs showed temperature reactions and refused feed for a few days following their *choleraesuis* exposures. These results indicate that, with few exceptions, the pigs had not recently been exposed to *choleraesuis* infection prior to their being placed on experiment, and that a definite and at times high agglutinin development usually followed their exposure to the infection.

DISCUSSION AND SUMMARY

A summary of the results obtained in these experiments is shown in table 1. In preparing this table pigs were classified as being sick on any day that they showed one or more of the following symptoms: (1) refusal of feed, (2) temperature 104 F. or higher, or (3) diarrhea.

The number of days a pig was sick represents the total throughout the test and does not necessarily represent illness on consecutive days. Some pigs were sick for but one day, this usually being the first day following culture feeding. The grouping on the basis of the number of days sick is entirely arbitrary. However, it was evident that illness resulting in less than four

days of symptoms, while being definite, was not pronounced in character, whereas an illness of more prolonged duration was considered to have greater significance.

In some of the experiments a large percentage of pigs died or were severely affected as a result of their *S. choleraesuis* exposures, while in others the disease was mild in character. However, with few exceptions there always was evidence of at least a transient illness. Such a range of infection appears to offer an opportunity for protective value of the nicotinic acid to become apparent.

A comparison of the results obtained in the nicotinic acid group with those of the

group receiving no acid, based on the occurrence of deaths and morbidity in the pigs, shows little if any difference that appears to have significance.

The data indicate that the protective value of nicotinic acid against *S. choleraesuis* infection was not sufficient to encourage its use as a specific preventive or curative measure for this type of bacterial infection of swine. However, it should be recognized that the uncertainty which frequently surrounds the etiology of outbreaks of swine enteritis occurring under farm conditions is such that the evaluation of the influence of nutritional factors upon this disease may not yet be clearly established.

The Etiology of Summer Eczema in Dogs

ALFRED KISSILEFF, V.M.D.

Flourtown, Pa.

IT WAS DEMONSTRATED in 1937¹ that the dog flea, *Ctenocephalus canis*, is intimately concerned with the development and perpetuation of the common skin disease of dogs, popularly termed summer eczema. In that report it was pointed out that the outbreak of the disease was coincidental with the seasonal appearance of fleas on individual dogs possessing a specific sensitivity to flea bites. A variation in the degree of this sensitivity was observed and described. The continued presence of fleas on the skin-sensitive dog was found to be responsible for bringing about the symptoms by which the disease is recognized, and these two factors—fleas plus sensitivity—were considered of primary importance. The absolute elimination of fleas as an exclusive therapeutic measure was found entirely effective in controlling the disease, and in preventing recurrence.

Clinical observations in support of these findings have been published by McClelland² and Theobald³ since, and further studies in sensitivity to flea bites have been stimulated.

In 1939, Cherney, Wheeler, and Reed⁴ investigated and described a well-defined variation in skin sensitivity to flea bites in man. The skin reactions studied were quite typical in sensitive persons and notably absent in the nonsensitive ones. These authors were of the opinion that continued exposure to flea bites conferred some form of immunity. An extracted antigen prepared from dog fleas was used on some of the patients and beneficial results were reported.

Following this work, Cherney and McIvor⁵ reported the results of desensitizing 61 persons with a polyvalent antigen made from dog fleas (*C. canis*) and house fleas (*Pulex irritans*), these species being the only ones recovered from flea-bitten patients. Their results were encouraging in

¹Presented before the Keystone Veterinary Medical Association, Philadelphia, March 25, 1942.

²Kissileff, Alfred: The Dog Flea as a Causative Agent in Summer Eczema. J.A.V.M.A. xciii (July 1938), p. 21.

³McClelland, F. E.: The Hospital Case Study and Observation of Canine Dermatitis. Proc. Ohio State Veterinary Medical Association, 1939.

⁴Theobald, A. R.: Parasitic Skin Diseases of Dogs. J.A.V.M.A. xcvi (Aug. 1940), pp. 139-144.

⁵Cherney, L. S., Wheeler, C. M., and Reed, Alfred C.: Flea-antigen in the Prevention of Flea Bites. Amer. J. of Trop. Med. xix (July, 1939).

⁶McIvor, Barbara C., and Cherney, L. S.: Studies in Insect Bite Desensitization. Amer. J. of Trop. Med. xxi (May 1941).

a majority of the group to the extent that relief from the irritation of the flea bites followed one or more injections of the antigen. The relief gained was not permanent in all cases, but progress in this direction was obvious.

Attempts to desensitize dogs against flea bites have been discussed by Owens⁶ and successful control of summer eczema was claimed in some instances. The report covered a brief résumé of the technique used and of the clinical results but many details were lacking.

As yet, there is no evidence to show that dogs develop a true immunity to flea bites although there are some instances of an acquired immunity reported in experimental laboratory animals. In one case,⁵ a ground squirrel (*Citellus douglassii*) acquired a complete resistance to the squirrel flea (*Diamanus montanus*). The culture of fleas on this animal was observed to die out completely after a period of three years during which approximately 10,000 fleas were permitted to feed on its blood, and new fleas introduced failed to thrive or reproduce.

It may be said, from what information is now available, that a certain resistance to flea bites which might be termed immunity, may develop following massive infestations with fleas or the administration of a prepared flea antigen. It should be added, however, that desensitization is not a direct step toward the elimination of the disease-provoking agent. Future exploration of the allergic principles involved in summer eczema will pave the way to a clearer understanding of the precise mechanism of sensitivity to flea bites, but the flea itself will always remain to be dealt with. The point to be emphasized in summer eczema is the distinction between sensitivity and the specific agent toward which the sensitivity is directed. Hence the concentration of effort on desensitization only, admits of failure to conquer an insect pest and practically insures it against extinction.

One of the basic principles of rational therapeutics is the elimination of the provocative agent. Where it is possible to ac-

complish this objective, no other measure can be nearly as effective or as permanent.

Most practitioners are naturally cautious about accepting any radical changes in the treatment of skin diseases, especially summer eczema. Summer eczema is a unique disease about which a great deal has been written. It responds to many treatments, and is said to arise from many causes. Where the traditional treatments meet with success, the practitioner is generally satisfied, but where recurrences are frequent, the same treatment turns out to be but another palliative one. It is not the purpose of this paper to condemn symptomatic treatment, but rather to present a more comprehensive picture of the underlying causes of the disease which suggest their own treatment. It is believed that by a more critical interpretation of the symptoms of summer eczema, its etiology will be better understood, and the puzzle of the scratching dog will be untangled.

It was stated in an earlier report¹ that the lesions of summer eczema are, for the most part, self-inflicted abrasions in various stages of healing. The manner in which these abrasions are inflicted will be discussed later. The change in the appearance of the skin is one of the most prominent features and it is this feature that suggested some complex pathological condition. Some authors have insisted that the disease is a dermatitis rather than an eczema. Others have applied the names used by skin-specialists. These terms have been used to identify the disease more specifically, and to classify its forms in accordance with the types of lesions predominating at the time the diagnosis is made. This custom has given rise to the general impression that acute eczema and chronic eczema, moist eczema and dry eczema, etc. were independent entities, wholly unrelated etiologically. The orthodox descriptions of eczemas in dogs assumes that the exact cause is obscure. As long as we accept this reasoning, a complete understanding of summer eczema will be unlikely, but by changing our point of view, it is possible to clear up some of the uncertainties.

⁶Owen, F. H.: New Treatment for Summer Eczema. N. J. Vet. Med. Assoc., Jan. 15, 1941.

I propose that the symptoms be looked upon as functional, rather than morbid changes, and that they be grouped as temporary organic responses to increased functional demands. The progress of the disease is a process by which the body adjusts itself to an extended period of moderate adversity, following a natural course of adaptation to environment. When this viewpoint is accepted, the disease and all its symptoms can be perceived as a highly intensified adaptative performance in which an important organ, the skin, is acting in its capacity of protecting vital parts from external injury. All the symptoms of summer eczema, from its inception to the worst chronic stages, are fundamentally defensive maneuvers of the body against an external irritant which can not otherwise be successfully evaded.

A prerequisite to the development of summer eczema is skin sensitivity of the individual. While there is as yet no means for testing the sensitivity of dogs to flea bites there are numerous ways by which sensitivity is manifested. The daily habits and behavior of the skin-sensitive dog will reveal certain characteristics of the potential victim of summer eczema. This type of dog shows a ready response to practically all stimuli and his reflexes are unusually sharp. He is likely to be more inquisitive and more alert than the average dog and he is easily startled by buzzing noises, especially those made by insects. He is fond of hunting such insects as beetles and house flies, but the blood-sucking flies frighten him. His skin response to the slightest contact is instantaneous. When groomed he is apt to turn his body in a half-curved position and execute scratching movements with one foot. The owner of such an individual will usually mention the fact that the dog is nervous or highly bred. The dog is in truth, highly insect-conscious because of his sensitive skin and his anxiety is by no means unwarranted. The presence of a flea will cause him extreme uneasiness and he will perform sudden peculiar antics which often terminate with a frenzy of scratching. The continued presence of fleas ultimately leads to the development of a series

of voluntary movements which soon become established as fixed habits. These habits consist of coördinated reflexes directed at removing, by means of friction, sources of skin irritation. The friction may be applied in several ways, by scratching, biting and licking, rubbing against stationary objects, crawling, or rolling on the back. Through constant practice these activities reach a remarkable state of efficiency and become automatic.

During the early stages of summer eczema there are no visible lesions present. This preliminary period may be called the first, or initial phase of the disease, during which the dog becomes acquainted with fleas and begins training himself in the most primitive methods of applying friction to dislodge or destroy them. This phase of the disease is often overlooked, mainly because of the absence of visible lesions, or symptoms other than scratching. For example, a dog may be presented for examination with the complaint that it scratches for no apparent reason. A careful physical examination is made and nothing is found upon which an accurate diagnosis can be based. There are no signs of internal disease or internal parasites, the diet is found to be adequate, and externally the only sign of irritation is a faintly reddened area of the skin which the dog recently scratched. No external parasites can be found and to all appearances the dog is in good health. Still it scratches, and the owner demands an explanation.

The first question arises: Is there any sound reason for the scratching? Most assuredly there is a reason, for a dog scratches only in response to a stimulus which produces a point of irritation. In the absence of parasites, how can one account for a point of irritation? It should be remembered here that the absence of fleas at the time of examination is not proof that the dog is not flea-bitten. A flea bite can cause prolonged irritation, as long as five days after its infliction¹; furthermore, many dog owners who for some strange reason are embarrassed by their dog's fleas, will carefully bathe or groom the dog and pick off every last flea before bringing

it in for examination.' Thus, the very evidence upon which a correct diagnosis could be established, is unwittingly destroyed and one must improvise some solution to the problem. In the event that a diligent search reveals no fleas, there still remains another means by which it can be proved that the dog is harboring these parasites.

If the dog has not been bathed, it is possible to gather some of the tiny crumbs of flea excrement from the dog's coat by the use of a fine-toothed comb. These crumbs consist largely of water-soluble blood pigments, and if placed in a drop of water on a white surface, an unmistakable red stain will immediately appear. When it is impossible to satisfactorily demonstrate that the dog is flea-bitten, a diagnosis should be withheld until a house visit can be made and the dog's surroundings completely surveyed.

In the majority of cases it will be learned that the scratching dog showing no visible lesions and no other definite symptoms is simply a skin-sensitive, flea-bitten, individual passing through the first phase of summer eczema.

The extension of the disease beyond the first phase depends entirely upon the continued presence of fleas in increased numbers. According to Boycott⁶ and Pawlowsky⁷ a succession of bites sharpens sensitivity in the human skin and there is sufficient evidence to indicate that successive biting also increases the sensitivity in the skin of dogs.¹

The weather, the diet, the amount of exercise or the administration of internal medicine will not directly modify the course of summer eczema unless fleas are eliminated.

In the second phase of summer eczema, the first visible skin lesions make their appearance. Abrasions and thinning out of the hair are most noticeable. A suspicion is easily aroused that an eczematogenous agent is present but the regional distribution of these lesions does not bear out such a contention. The lesions will be invariably confined to the anterior two-thirds of the

body surface, principally limited to parts which can be conveniently reached by the hind claws. The neck, jaws and axillary regions are primarily involved.

The lesions are always preceded by vigorous scratching concentrated on one spot and are essentially of the same character as friction burns. When the scratching subsides, the traumatized area promptly forms a scab under which the normal process of healing begins. Renewed scratching interrupts the healing process, resulting in the formation of a larger area of involvement, and as scratching becomes generalized, the lesions are suspected of being some form of eczema that is rapidly spreading. However, this is not the case since none of the lesions appear until after the area has first been subjected to friction, and the lesions at this stage are wholly of traumatic origin. As soon as the dog permits it, the involved area will promptly revert to its normal appearance as healthy skin.

Another lesion associated with scratching, but not directly inflicted by the hind claws, is a dry, bald spot in the region of the tuber ischium and it may be on one or both sides. This bald spot is created by excessive wear on the skin over the bone from the shifting of the dog's weight to this region while scratching from a sitting position. The same lesion is also found associated with certain other chronic skin irritations which lead to scratching of the head parts for long periods, especially inflammation of the ear canal from mange mites.

It may be seen here that the second phase of summer eczema, in which the first skin lesions appear and the hair begins to thin out, is no more than a continuation of scratching, plus the damage attending it. The damage consists of lacerations or abrasions of the skin, and deliberate removal of the hair-shafts. The hair roots are not greatly affected and the condition seen is not a true alopecia, the distinction being the manner in which the hair is lost. In alopecia the hair falls out while in summer eczema it is forcibly removed.

The culmination of the second phase of

⁷Pawlowsky, E. N., Stein, A. K., and Perfiljew, P. P. (*Ztschr. f. Parasitenk v* (1932), p. 1.

the disease comes with the gradual migration of the fleas to a region of the body which is out of reach of the activity of the hind feet, and where the hair coat is heavy enough to provide some degree of protection against sudden dislodgement. The area selected is the lower part of the back near the root of the tail, and during most of the day, conditions here for the feeding habits of the flea are most favorable. The disease then enters a third phase which is accompanied by a characteristic symptom familiar to all practitioners. The dog quickly learns the futility of scratching under this new situation where the fleas are out of range. The only way he can contact them is with his teeth and he proceeds to twist his body around and bite viciously at the lower back. The position necessary to carry out this operation is a difficult one for the dog to maintain because of the rigidity of the spine and the resistance of the strong back muscles; therefore, the biting is done hurriedly and with little or no regard for the consequent effect on the skin itself. This effect is almost immediate destruction of the hair and outer layer of the skin, and a bleeding, raw patch results which the dog licks carefully for several days afterward. Several of these patches may appear as the biting and licking continue.

The scratching, biting, and licking motions are all voluntary responses to the irritation of flea bites, and when all three are in progress, with their resultant traumatic injuries, the full-fledged acute case of summer eczema is recognized. This phase of the disease may appear at any time after the first two phases have been experienced, and recurrent attacks usually begin in the third phase.

The fourth, or final stage of the disease is marked by structural changes in the skin which arise from two sources: (1) the damage from the voluntary actions, and (2) the involuntary responses to the constant irritation.

This phase of the disease has often been described as a seborrheic or chronic eczema, and the appearance of the skin is greatly

altered in many places. The thickness of the skin varies in different parts of the body surface and this difference in thickness parallels a difference in the type of lesion produced. Where the skin is thick and a normally heavy coat predominates such as the region of the back, a dry, scabby, and calloused lesion is produced. The underparts of the body, where the skin is thinner and the hair scanty, develop rapid changes in color to almost black, and the surface becomes wrinkled and greasy. The skin covering the throat, the inner thighs, the axillae, and sometimes the entire surface of the abdomen and also the external ears may be afflicted. These skin changes are strongly suggestive of hypertrophic protective reactions to repeated external injuries. These injuries, under normal circumstances, would heal uneventfully, but the healing process is repeatedly frustrated and the skin is forced to adapt itself to the extraordinary situation where the dog does not permit healing to become complete. The skin, therefore, follows the same course as do other organs when functional demands perpetually exceed the normal threshold. The skin undergoes a gradual functional hypertrophy which is directly parallel to the protracted irritation. The change in color is due to deposits of melanotic pigment in the epithelium, these deposits being similar to the pigmentation which follows mild burns.

None of the skin changes seen in the advanced phase of summer eczema can be classified as degenerative changes since there is no organic degeneration involved. The changes are temporary, merely reflecting the intensity or persistency of the stimulating causes. The general health of the patient is not impaired. It continues to eat and properly digest its food and there is no systemic disturbance worthy of mention. All other body functions are normal and life is not threatened.

Despite the altered appearance of the skin, it still functions perfectly as a protective organ, and it has adapted itself admirably to the demands made upon it. The scratching and biting is less damaging in

the advanced phase than in the early stages, for instead of lacerating the skin, the scraping hind claws slide harmlessly over the toughened, calloused hide, and even prolonged and vigorous biting rarely breaks through it.

The loss of the hair and the thickening of the skin proper, limits to a great extent, the activities of the fleas and their access to food. On the whole the dog is better equipped to deal with the parasites after the skin changes have taken place, than before.

In summing up the etiology of summer eczema, there are but two essential points to remember: (1) The aggravating cause is simply a continuous cycle of fleas attacking the dog, and the dog attacking itself; and

(2) The effect brought about indicates a functional accomplishment of the skin in achieving its purpose.

A Necessary Investment

It is perfectly natural that the government and the public as a whole should request the full coöperation of the American Veterinary Medical Association in this period of serious emergency.

An unparalleled amount of added work has been placed on the shoulders of the executive officers of the association and, although their personnel is limited, they have done a splendid job of integrating veterinarians and the interests of veterinarians in the national complex.

Through the efforts of this association deferment was obtained from selective service for veterinary students. Also through their influence and suggestions every veterinary practitioner will have tires for his car. Their full coöperation with the Office of Defense Health and Welfare Service is reflected in the rapid development of the state and corps area committees on Procurement and Assignment.

There are still many qualified veterinarians who have failed to join the A.V.M.A. Is it asking too much that every man who carries a veterinary degree support this organization by joining now? Can any one

argue that the future guidance of his profession plus the best veterinary journal published anywhere on earth is not worth a five dollar initiation fee and five dollars a year in dues?

If you are not already a member get in touch with your resident state secretary today. If you are a member lend a hand and send in all the new memberships possible.—*Editorial, Bio-Chemic Review, xiii (1942), p. 6.*

Do Sulfa Drugs Prevent Natural Immunity?

The fear that sulfonamide drugs inhibit the immunizing property of bacteria by diminishing antibody formation is a logical subject for serious study now that this group of drugs has come into such general use in the treatment of microbial diseases which leave behind the blessings of immunity. There are opposing schools of thought in this connection—the pro and the con—and both have registered proof of their respective contentions. The facts on both sides were determined by experimental studies in laboratory animals, but only in pneumonia. From these the *Journal of the American Medical Association* concludes that in so far as pneumonia is concerned the sulfa drugs do not interfere with the development of an active immunity.

Urges the Use of More Horses

The National Horse Association of Great Britain, like its counterpart, the Horse and Mule Association of America, stresses a timely view of the fact that the shortage of gasoline, oil and other materials, is creating difficulties in commercial transportation which a more extensive use of horses could relieve. The Association points out that everything connected with horse transport (feed, harness, vehicles) are "home grown" and could, therefore, relieve the strain on oversea shipping. The short haul, particularly that involving many stops, is the province of the horse, the report claims. The question of relative costs is discussed in detail.—*From The Veterinary Record, June 8, 1942.*

Phenothiazine-Medicated Pellets for Range Sheep

ERNEST C. McCULLOCH, D.V.M., Ph.D.

Pullman, Washington

OBSERVANT SHEEP RAISERS have noted a decline in growth and vigor of some bands of range sheep. Most operators have attributed this to inferior pastures resulting from over-grazing and restrictions on the use of public lands. Although these may be contributing factors, infestations with nematode parasites appear to be more directly responsible. Instead of range sheep moving over boundless areas under environmental conditions that would make the completion of the life cycles of nematode parasites improbable, convenient watering and bedding places have been used for extended periods and frequently by successive bands of sheep. These areas and the moist meadows adjacent offer ample opportunities for parasitic infestations. Moreover, many bands are maintained on lowland pastures during the fall months.

The degree of infestation and the predominating type of parasite vary with different flocks, although the heaviest concentration of parasites and the most serious losses occur in the lambs borne the previous spring and especially in the "tail" bands. These include the less-thrifty members of other bands which are usually placed on green, lowland pastures for special feeding in the late summer. Diarrheas are commonly observed in these sheep and cases of severe emaciation are by no means rare. The subcutaneous edema responsible for the condition known as "bottle jaw" and the extreme anemias that classically suggest *Hemonchus contortus* infestation have only occasionally been observed by the writer. Autopsies have revealed significant numbers of *H. contortus*, *Ostertagia circumcincta*, *strongyloides* spp., *Trichostrongylus colubriformis** and *Trichostrongylus*

vitrinus.* *Trichuris ovis*, *Moniezia* sp. and *Eimeria* spp. also are present in many sheep.

No drug or combination of drugs is known to be reasonably effective against all of the internal parasites of sheep. A review of the literature indicates that phenothiazine might be reasonably satisfactory, although not all investigators are in accord as to the efficacy of this drug against the various sheep parasites. The evaluation of the data presented by various workers is complicated by the different criteria of efficiency employed. Some have made true critical tests of anthelmintic efficiency, with the expelled worms being collected and counted and then the animal killed and the surviving worms counted; more investigators have based conclusions upon the reduction of parasitic ova per gram of feces after the administration of the drug, while still others have based conclusions upon the increase in weight or improvement in condition of the treated animals as compared with untreated controls.

Only by critical tests can the efficiency of an anthelmintic be ascertained. A decrease in the number of parasitic ova in the feces following medication is not necessarily conclusive evidence of anthelmintic efficiency, because sublethal concentrations of anthelmintics may cause egg production to cease. A decrease in egg production should not be considered significant unless it persists over a reasonable time, during which control animals continue to give high egg counts, since the egg production of some nematodes is known to be erratic.

Tests in which the criterion is an increase in gain or clinical improvement of the treated animals, as compared with the controls, will determine whether or not an anthelmintic will be accepted by the livestock raiser. This is the only method that takes into consideration the effect of the anthelmintic on the growth and develop-

From the Division of Veterinary Science. Published as paper No. 518 College of Agriculture and Agricultural Experiment Station, State College of Washington.

*Specific identification made by Mr. J. T. Luckner, Zoological Division, Bureau of Animal Industry, U. S. D. A.

ment of the host animals. Unfortunately, this method frequently is the most difficult method to evaluate.

REVIEW OF LITERATURE

Critical experiments show phenothiazine to be particularly effective against *Oesophagostomum columbianum*, *Ostertagia ostertagi*, *Cooperia curticei* and *Bunostomum trigonocephalum*. Most investigators also agree that the drug is reasonably effective against *H. contortus* and *Nematodirus filicollis*; the efficacy of phenothiazine against *Chabertia ovina*, *Trichostrongylus* spp. and *Strongyloides* spp. is controversial while *Trichuris ovis*, *Fasciola hepatica* and *Moniezia* spp. are resistant.

In their early experiments, Gordon and Whitten (1939)¹ observed that the administration of from 0.3 to 0.75 Gm. of phenothiazine per kg. (2.2 lb.) of bodyweight, on three successive days, removed all *H. contortus* from eight sheep. Single doses of 0.02 to 0.08 Gm. per kg. were less effective although they were followed by a marked decrease in the number of ova in the feces. The following year Gordon² obtained data which led him to conclude:

Phenothiazine in doses of 0.6 Gm. per kg. of body weight was highly efficient in destroying immature *H. contortus* ten to fifteen days old. The practical significance of this finding is considerable, for whereas with the other anthelmintics commonly used treatment must be repeated at short intervals in order to destroy worms which are immature at the time of initial treatment, phenothiazine destroys a high proportion of all worms present, irrespective of their stage of development. If an outbreak of haemonchosis be treated with this drug, it should not be necessary to repeat treatments at such short intervals as with anthelmintics having little or no effect on immature forms of this parasite.

Previously, Gordon³ had found copper sulfate to be very ineffective against immature *H. contortus*. Carbon tetrachloride

or mixtures of copper sulfate with nicotine sulfate or sodium arsenite also were less efficient against the immature stages of this parasite.

As an anthelmintic against *Oe. columbianum*, Roberts⁴ found a mixture of 93 per cent phenothiazine, 5 per cent beta naphthol and 2 per cent wetting agent to be very effective in adult sheep but somewhat less satisfactory when administered to lambs. The dosage used was 0.4 Gm. per pound of body weight.

Gordon⁵ found 0.6 Gm. of phenothiazine per kg. of body weight to be from 4.5 to 100 per cent effective against *Oe. columbianum* when one-third this dosage was given each day for three days; from 50 to 82.1 per cent effective when the dose was divided between two days and from 20 to 100 per cent effective when administered as a single dose. He concluded: "Phenothiazine offers great promise for the successful treatment of oesophagostomiasis by drenching. Satisfactory results may be obtained without the necessity for ensuring that the drug passes directly into the abomasum, if a large enough dose be given." The effect of phenothiazine upon *Trichostrongylus* spp. was investigated by Gordon⁶ who administered doses of 0.3 Gm. per kg. and concluded: "The high degree of efficiency of this drug against *Trichostrongylus* spp. in sheep represents an extremely important advance in the control of these parasites and indicates that phenothiazine is likely to have a very wide and valuable application in the control of the more important nematodes of sheep in Australia (*Oe. columbianum*, *H. contortus* and *Trichostrongylus* spp.)."

Harwood, Habermann and Jerstad⁷ like-

⁴Roberts, F. H. S.: The Value of Phenothiazine in the Treatment of Oesophagostomiasis in Sheep. Aust. Vet. Jour. xv (1939), p. 237.

⁵Gordon, Hugh McL.: Preliminary Note on the Chemotherapy of Oesophagostomiasis of Sheep with Special Reference to the Efficiency of Phenothiazine. Jour. Coun. Sci. Ind. Res. (Aust.) xii (1939), pp. 203-206.

⁶Gordon, Hugh McL.: Preliminary Note on the Anthelmintic Efficiency of Phenothiazine Against *Trichostrongylus* spp. in Sheep. Jour. Coun. Sci. Ind. Res. (Aust.) xii (1939) pp. 345-347.

⁷Harwood, Paul D., Habermann, Robert T., and Jerstad, A. C.: Efficacy of Commercial Phenothiazine in the Removal of Roundworms from Sheep. Veterinary Medicine xxxiv (1939), pp. 440-443.

¹Gordon, Hugh McL., and Whitten, L. K.: A Preliminary Note on the Anthelmintic Efficiency of Phenothiazine Against *Haemonchus contortus* in Sheep. Jour. Council Scientific and Industrial Research (Australia) xii (1939), p. 207.

²Gordon, Hugh McL.: The Anthelmintic Efficiency of Phenothiazine Against Immature *Haemonchus contortus*. Jour. Council Scientific and Industrial Research (Australia) xiii (1940), p. 245-246.

³Gordon, H. McL.: Aust. Vet. J. xv (1939), pp. 57-66. Quoted from "2."

wise found phenothiazine to be effective against *Oe. columbianum*, *Ostertagia* spp. and *H. contortus*.

The critical tests of Singer and Baker⁸ led them to state:

Our experimental work confirms the reports that phenothiazine is an effective anthelmintic for the intestinal nematode parasites of sheep. The drug seems to be particularly effective for the removal of *O. columbianum*, *O. ostertagi*, and *C. curticei*, less effective against infections with *N. filicollis* and *H. contortus* and ineffective for infections with *T. ovis*, *Trichostrongylus* spp., and *Strongyloides* spp.

Phenothiazine is a more efficient anthelmintic than the copper sulfate-nicotine sulfate mixture, and tetrachlorethylene. This is particularly evident in its action against the nodular worm, a parasite which neither of the other drugs affects. The drug does not seem to be toxic and produces none of the untoward effects resulting from the use of tetrachlorethylene and carbon tetrachloride.

When the efficacy of the medication has been judged by increases in weight over untreated controls in the same flock, the results have been favorable to phenothiazine medication.

Bodie, Corner, Morgan and Sloan⁹ concluded that, "On the evidence of egg-counts, the weights, and the post-mortem examinations, phenothiazine is a more effective anthelmintic for sheep than the copper-nicotine mixture." During their experiments, the lambs receiving phenothiazine gained an average of 32.8 lb., those receiving copper sulfate and nicotine solution 29.7 lb. and the controls 28 lb.

Lambs treated with phenothiazine by Stewart and Crofton¹⁰ gained 37.1 per cent, copper-sulfate-nicotine treated lambs gained 35.7 per cent while the controls gained 31 per cent. They concluded: "The effect of phenothiazine proved to be greatest on what are considered the most pathogenic species, i.e., *Ostertagia* spp. and *Trichostrongylus axei*. Phenothiazine

proved less effective than copper-nicotine solution in removing *Moniezia expansa* and *N. filicollis*." Analysis of their data indicates that neither phenothiazine nor the copper sulfate-nicotine solution was effective against the species of *Trichostrongylus* living in the small intestine.

According to Threlkeld¹¹ the *Trichostrongylus* spp. occurring in the small intestine, *B. trigonocephalum* and *Moniezia* spp. are the parasites most resistant to phenothiazine. This is confirmed by Boley, Levine, Wright and Graham¹² who found: "In sheep, goats and cattle, phenothiazine is much more satisfactory than any other anthelmintic against stomach worms (*H. contortus* and *Ostertagia*, nodular worms (*Oesophagostomum*), and bankrupt worms (*Trichostrongylus*). On the other hand, it has no appreciable effect upon certain other worms which parasitize the intestinal tract such as *Nematodirus*, *Strongyloides* and *Trichuris*." They also mention the refusal of sheep to eat food medicated with phenothiazine.

Shaw¹³ found phenothiazine to be relatively ineffective in treating Oregon sheep for the more common and serious parasites, while the lambs treated with phenothiazine by Herrick, Winkler and Morgan¹⁴ showed as many lesions from nodular worms as did those given copper sulfate; moreover, they neither gained faster nor brought higher market prices, although both treated lots made faster gains than the untreated controls. It was concluded from their experiments: "Since phenothiazine is more expensive than copper sulfate, and may not be any better, at present there is no reason to use the newer preparation in de-

¹¹Threlkeld, W. L.: Helminth Parasites in Sheep. Virginia Agricultural Experiment Station, Tech. Bulletin 68 (1941).

¹²Boley, L. E., Levine, Norman D., Wright, Wilson L., and Graham, Robert: Phenothiazine in the Treatment of Gastro-Intestinal Parasites of Animals. Paper presented at 58th Annual Meeting of the Ohio State Veterinary Medical Association, Jan. 8, 1941.

¹³Shaw, J. N.: Use of Phenothiazine in Oregon Sheep. North American Veterinarian xxii (1941), pp. 280-283.

¹⁴Report of the work of Herrick, C. A., Winkler, C. H., and Morgan, B. B., in cooperation with Ott, G. L.: What's Best for De-Worming Sheep? Annual Report of the Director, Agricultural Experiment Station, University of Wisconsin. Bulletin 453 (1941) p. 8.

⁸Singer, Arnold J., and Baker, Donald W.: Phenothiazine as an Anthelmintic for Intestinal Nematode Parasitisms in Sheep. Cornell Veterinarian xxx (1940), pp. 375-382.

⁹Boddie, G. F., Corner, H. H., Morgan, D. O., and Sloan, J. E. N.: Field Trials with Phenothiazine on Lambs. Veterinary Record llii (1941), p. 1.

¹⁰Stewart, W. Lyle, and Crofton, H. Draper: Parasitic Gastritis in Sheep. Veterinary Record llii (1941), pp. 167-170.

worming sheep under Wisconsin conditions."

Therapeutic amounts of phenothiazine do not appear to exert any deleterious effect upon sheep. Weekly doses, repeated six times, of 25 Gm. to yearling lambs were found by Wright¹⁵ to be without effect upon the blood hemoglobins and weight gains and to cause no pathologic constituents to appear in the urine.

PRODUCTION OF PHENOTHIAZINE-MEDICATED PELLETS

Under western conditions, the individual medication of range sheep rarely is feasible. Mixtures of powdered phenothiazine with whole or ground grains usually were refused by sheep, although the mixtures did not alter the flavor or odor of the grain sufficiently to be detected by humans.

Experiments were conducted in which the phenothiazine was incorporated into pellets made of sheep feeds. A mixture of 15 parts phenothiazine, 75 parts finely ground oats and 10 parts of stock molasses with sufficient water to make a paste, was forced through a funnel and dried. Sheep readily ate this product, which retained the efficiency of the phenothiazine incorporated. In adapting this method to low cost production methods, advantage was taken of the fact that in this region concentrates molded into the form of pellets are fed to most range sheep during the fall and winter months. The machines for producing the pellets are located at convenient points in western areas. The additional cost of pelleting, about \$2.00 per ton, is considered to be more than saved by ease in feeding and reduction in waste.

Experiments were made to incorporate the optimum amount of phenothiazine into the pellets. The formula the writer found most satisfactory for sheep accustomed to eating pea products meal pellets is:

	Parts
Phenothiazine*	15
Very finely ground oats...	30
Pea products meal.....	45
Molasses	10

No water is added. The finely ground

oats are placed in the mixing hopper, then the phenothiazine, and these are mechanically mixed for approximately 20 minutes, or longer if necessary, in order to produce a uniform mixture. The pea products meal is then added, the mixing continued and then the molasses added last, followed by further mixing. The mixture is then forced under great pressure, through one-half inch perforations by the machine. The resulting pellets (figure 1) are of good appearance and hold together well enough to allow storage, handling and feeding. In regions in which feeds other than pea products meal are the most economical concentrates, they may be substituted. Phenothiazine medicated pellets made without the finely ground oats tended to crumble and were not satisfactory, while sheep refused to



Fig. 1—Phenothiazine-medicated pellets.

eat phenothiazine medicated pellets that did not contain molasses. Oat flour is recognized as an anti-oxidant and stock molasses is rich in reducing sugars. It is possible that the oat flour and the molasses delay the oxidation of phenothiazine to products objectionable to sheep.

¹⁵Wright, Wilson L.: A Note on the Effect of Repeated Doses of Phenothiazine on Sheep. *Veterinary Medicine* xxxvii (1942) p. 33.

*The phenothiazine was furnished by E. I. duPont de Nemours & Company.

FEEDING THE PELLETS

Sheep accustomed to eating pea products meal and molasses pellets eat the phenothiazine medicated pellets without hesitation. From $\frac{1}{4}$ to $\frac{1}{2}$ lb. per sheep usually is fed. Forty lb. placed in troughs before 100 sheep were cleaned up in approximately 10 minutes and the amount consumed appeared to be reasonably well distributed to every sheep. It is essential to have sufficient trough space or to distribute the pellets over sufficient clean ground to allow every sheep to reach a supply. One-half lb. of these pellets contains 34 Gm. phenothiazine, $\frac{1}{3}$ lb., 22.7 Gm.; and $\frac{1}{4}$ lb., 17.0 Gm.

Sheep accustomed to grain feeding, but not to pellets, require from two to four daily feedings to become accustomed to pellets. In trials made by the writer, the following procedure was used: The first day, a band received nonmedicated pea products meal molasses pellets at the rate of $\frac{1}{8}$ lb. per sheep, the second day $\frac{1}{4}$ lb., the third day $\frac{1}{3}$ lb., while on the fourth day they readily ate $\frac{1}{2}$ lb. per sheep of the medicated pellets.

Lambs or sheep that never have been fed concentrates, may require longer preliminary feeding with nonmedicated pellets before they will take the pellets readily. Our experience, which includes over 12,000 sheep, indicates four or five preliminary feedings to be sufficient. However, the medicated pellets should not be offered until all of the sheep have learned to eat the nonmedicated pellets; otherwise a few sheep may receive a disproportionately large dose and others none.

FIELD EXPERIMENTS

Approximately 400 of the least thrifty lambs were segregated from 10,000 sheep. Of these, 200 were given four daily preliminary feedings of nonmedicated pellets and then one feeding of 75 lb. of the phenothiazine medicated pellets. The other 200 lambs were to have served as controls, but after six weeks the owner insisted on treating them as well.

Previous to medication, fecal counts had revealed the presence of large numbers of

the ova of *H. contortus* and fewer ova of *Trichostrongylus* spp., while ova of *T. ovis* were present in considerable numbers in the feces of some sheep and absent in others. *Eimeria* spp. were found in the feces of practically all of the sheep examined.

Fecal samples taken four days following medication revealed almost no stomach worm eggs and approximately a 75 per cent decrease in trichostrongyle eggs. The whipworm eggs never were present in sufficient numbers to form the basis for critical estimates, but appeared to be unaffected by the medication, while *Eimeria* spp. oöcysts appeared to be slightly more numerous than before treatment. During the six weeks following medication of the 200 sheep, the owner, who is an experienced sheep raiser, estimated that they gained from 10 to 15 lb. more than the controls. Unfortunately, facilities for weighing the sheep were not available. Following this demonstration, the owner purchased 3,000 lb. of the medicated pellets and treated all of his sheep. Successive flocks were then moved, and feces collected from the daily camp grounds were forwarded to the laboratory for examination. The herders commented upon the number of "large worms," *Moniezia* spp., passed, so apparently some long chains of segments of these worms are passed by some sheep following phenothiazine medication, although previous critical tests on a small number of sheep had indicated the drug to be without effect upon this parasite. The cost of this medication was approximately five cents per sheep.

PHENOTHIAZINE-MOLASSES MASS

Of 288 unthrifty yearlings removed from several large bands and pastured on lowland meadows, 31 had died before assistance was asked. An autopsy revealed enormous numbers, estimated to be from 10,000 to 20,000 per sheep, of *T. colubriformis* and *T. vitrinus*. The *T. colubriformis* were mostly in the abomasum, while the *T. vitrinus* were practically all attached to or embedded in the mucosa of the small intestine. *H. contortus* and smaller numbers of other parasites also

were present, with sufficient *Eimeria* spp., perhaps, to be significant. Symptoms of "black diarrhea," as described by Clunies and Gordon¹⁰ were present. Phenothiazine medication was decided on, although previous work had shown this drug to be less effective against *Trichostrongylus* spp. embedded in the intestinal mucosa. The sheep were too ill to justify pellet medication. A molasses-phenothiazine mass was prepared as follows: Fifteen lb. of powdered phenothiazine was placed on a large mixing board and 12 lb. (approximately 1 gallon) of cheap stock-feed molasses (blackstrap) added. By constant mixing and kneading, the molasses and phenothiazine powder were incorporated into a dough-like mass. This was spread over the board by means of a kitchen rolling pin and cut with a very small cookie cutter, the thickness being adjusted to give a weight of 36 grams. Each "cookie" therefore contained 20 Gm. of phenothiazine. This mass was placed well back into the mouth of sheep and was not rejected.

While phenothiazine powder will not mix with water, it was found that fresh "cookies" of the mass could readily be suspended in water, forming a convenient suspension for dosing. This is perhaps the most economical and convenient method of preparing phenothiazine suspensions. Clinical results were good. Following the administration of phenothiazine in this form, only 19 sheep were lost and 2 of these were unable to stand when the drug was administered. Approximately a 90 per cent reduction occurred in the number of ova of *Trichostrongylus* spp. present in the feces, while the *Eimeria* spp. appeared to be unaffected. Autopsies, three weeks later, of 2 sheep that had made clinical recoveries still revealed the presence of significant numbers of *T. vitrinus* in the small intestine. After 9 weeks the clinical appearance of this flock was remarkably good and fecal samples showed an even greater decrease in the number of trichostrongyle eggs passed.

In another trial, 8 aged ewes were each given 27 Gm. of the phenothiazine-molasses mass, representing 15 Gm. phenothiazine. Four days after medication the number of *H. contortus* and *Trichostrongylus* spp. ova in the feces dropped to between 15 and 25 per cent of the previous level. Autopsies 7 to 12 days later revealed no nematodes in the abomasum of 2, a few *H. contortus* in 3, between 50 and 200 in 2 and an estimated 700 in 1. In 3, a significant number of *T. vitrinus* were found. These ewes were greatly devitalized by caseous lymphadenitis.

Sheep receiving phenothiazine excrete a red dye or its leuco base, probably thianol and leucothianol, in the urine. This stains the wool and does not wash out during the ordinary process of cleaning. However, when flocks are properly tagged, this does not appear to be of appreciable economic significance.

The ultimate goal in the control of parasitic infestations must be to prevent infestation. Our present knowledge of the life cycles of the parasitic nematodes of sheep is sufficient to provide a basis for methods of management that will reduce these parasites below a significant level. Until this information is disseminated to sheep raisers and put into practice by them, the use of anthelmintics will be economically feasible, where the gains made by the treated sheep exceed those of the controls by a sufficient margin to pay the cost of medication and extra handling.

CONCLUSIONS

Western range conditions do not exclude the possibility of heavy infestations with parasitic nematodes.

Phenothiazine-medicated pellets afford a practical, convenient and reasonably efficacious method of treating range sheep infested with *Hemonchus contortus* and *Trichostrongylus colubriformis* in the abomasum.

For the individual medication of sheep with phenothiazine or for the preparation of phenothiazine suspensions, a mixture of 5 parts of phenothiazine with 4 parts of molasses forms a convenient and practical mass.

¹⁰Clunies, Ross I., and Gordon, H. McL.: The Internal Parasites and Parasitic Diseases of Sheep. Angus and Robertson Ltd., Sidney, Australia, 1936.

Calfhood Vaccination in a Brucellosis Control Program in Certified Dairies

C. W. BONYNGE, M.D.

Los Angeles

THE LOS ANGELES Certified Milk Commission began brucellosis control in their herds in 1927. A summarization of experiences and achievements to date is presented with especial emphasis on the last four years during which period calfhood vaccination has been practiced.

Three of the herds under supervision are large ones, ranging usually from 750 to 1,025 animals on individual farms with a total averaging 2,300 to 2,500 producing cows and as high as 1,500 heifers at pasture.

METHOD

Up to four years ago, control was based entirely upon bleeding and testing with elimination of the reactors. The standard, four-tube, agglutination test was employed—dilutions ranging from 1:25 to 1:200. *Brucella* strain 80 was used as the antigen which was formalized for about one-half of the period when a change was made to phenolated in order to conform with the national standard. Positive reactions were checked by repeated tube-test, or Huddleson's plate, method. The complement fixation test was tried for a time along with the agglutination test as a possible means of detecting infection at an earlier stage. While this procedure in occasional instances proved helpful in establishing the true status of questionable reactions to the agglutination test, it was abandoned as impractical for routine, dairy-animal testing. The bleeding and supervision of the herds was carried out by the Commission's veterinarian. All tests were made in the Commission's laboratory. Including investigations made on milk and experimental animals, close to three quarters of a million tests have been conducted to date.

TESTING MILK FOR BRUCELLA ABORTUS

In the earlier period, more than 500 samples of market milk were examined by guinea - pig inoculation. Concentrated cream and sediment was injected into duplicate animals *via* the peritoneal cavity and subcutaneous tissue, the latter producing

the highest number of positive results. Among the large number of the cultures recovered in this study submitted to the Hooper Foundation, the typing invariably showed them to be bovine strains; the porcine strain was never encountered. These tests, made as a control of the blood-agglutination results, showed that when the herd-reactor incidence was 1 per cent or under, the milk from that herd, with only one exception, proved negative in the rather severe inoculation test. To what extent this evidence could be depended upon to demonstrate the absolute safety of such milk for human consumption would be difficult to prove but from the experimental work of Otero¹ with human volunteers and the history of our own consumers, human infections should not appear. At any rate, our producers were advised that reactors should not be allowed to rise above 1 per cent even when testing every two weeks became necessary.

The earlier belief was that brucellosis control would be accomplished without great difficulty under a comparatively simple program of testing and segregation. True reactors might be isolated on the farm across a road and could be milked in the same stanchions following clean cows. Experience soon demonstrated these concepts to be erroneous. Although, recognition of the infected animals offered no difficulties, it was soon realized that segregation and isolation was fraught with difficulties on account of the incomplete knowledge concerning the epizootiology of brucellosis in the herds. Control under these circumstances proved a tremendous burden except in small herds and then only under the most favorable circumstances.

The original survey in 1927 of the herds

¹Director of Laboratories, Los Angeles Medical Milk Commission.

¹Otero, Pablo Morales: Experimental Infection of *Brucella Abortus* in Man, *Porto Rico Jour. Pub. Health & Tropical Med.* v(Dec. 1939), pp. 144-157.

under consideration showed an average incidence of 35 per cent reactors in 2,300 animals with a maximum of 40 per cent in one herd. Questionable reactions were around 10 per cent and in this early period the majority of these soon became definitely positive—evidence of the activity of the disease in the herds at that time. As control progressed and conditions improved, these doubtful reactions decreased until, at the present time, they are rarely encountered. Following the original survey, herds were bled and tested at approximately two-month intervals. As this did not prove effective, the large herds have been kept on a practically continuous, monthly, bleeding schedule until recently. However, in contrast to the large herds, one dairy of 225 cows showed an excellent record. This herd responded so quickly to control measures that in over a period of five years in 39 bleedings only four reactors were found. For two years, they remained entirely clean and were bled only trimonthly. Later, unfortunately, this dairy inadvertently allowed a few foreign cows to mix with their heifer herd. Infection was again established and though it was possible to keep the incidence down to a very low figure, they never regained the completely clean state and discontinued certification in 1938, owing to economic difficulties.

OBJECTIVE NOT ACCOMPLISHED

The scope of our program was extended in every possible manner in the effort to establish complete control. The practice of buying replacements was discouraged and when this was unavoidable the animals were tested at the point of purchase and again upon arrival at the farm where they were kept under especial surveillance. Individual heifer farms where their own calves raised in a disease-free environment were maintained, but the results were not as favorable as expected. It developed later that animals raised under these conditions were highly susceptible to brucellosis when introduced into the dairy herds. When breaks in control occurred, the infection spread rapidly among these animals.

Outside contamination through manure

disposal was eliminated. Under special contract, only manure hauling trucks confined to the work on certified dairies were employed. The danger of spread of infection at parturition was considered. Individual calving stalls were built of iron and concrete with direct sewer connections, providing for cleansing and disinfection between each parturition. Night watches were maintained to prevent the birth of calves in corrals. Heifer herds at pasture were tested. Feeding arrangements were installed so that cows passing from corrals to milking barns would not feed on alfalfa spilled on the ground. Other control and sanitary procedures might be detailed if space permitted, but in spite of all efforts, complete eradication of infection was not accomplished. The following agglutination records of the three large herds for the year 1934, the midperiod of this report, proved rather disappointing considering the previous seven years of intensive control measures with complete removal of reactors from all dairies:

- Herd 1—twelve bleedings averaging 1,000 animals average reactors—0.14%.
- Herd 2—twelve bleedings averaging 885 animals average reactors—0.1%.
- Herd 3—twelve bleedings averaging 700 animals average reactors—0.27%.

In general review of the situation at this period both the Commission and producers formed the opinion that under the methods of control then available, complete permanent elimination of brucellosis in large commercial herds was impossible. However, the program was continued. The herds were held as nearly as possible within the 1 per cent reactor limit. All herds varied from month to month in their test results. At times all would be entirely free then later suddenly suffer severe breaks. These breaks were frequently traceable to faulty management, carelessness, or a false sense of security. Some, however, were quite tragic owing to the fact that they arose without any discernible cause.

Credit is due the producers for their support of the program and their loyalty to all the ideals of certified milk. Control measures were expensive to the producer and have represented a significant part of the

total cost of production, including a production loss of approximately one-quarter pound of milk per cow following each bleeding, due to the physical manipulation of the animals. However, this has been offset to a large degree by the benefits which have been derived from the effort. Probably the greatest advantage has been the improved efficiency of the herds reflected in an increased average production, estimated at 8 to 10 per cent. The increased breeding efficiency, while it has been, naturally, a factor in this increased production, has also materially increased the number of viable calves produced annually, an important item in establishments which are producing their own replacements. Apart from these physical benefits the control of brucellosis in the herds has given certified milk definite prestige in a large raw milk market serving an area of 2,750,000 people. Epizootiologic statistics justify a confidence in certified milk. Nevertheless the economic burden and apparent futility of brucellosis control under prevailing circumstances was most discouraging. The tenets of control previously upheld had proven erroneous, and paradoxical. Test and elimination was not successful. Purchase of new animals was fraught with danger. Home bred heifers raised under ideal conditions had proved to be especially hazardous as replacements.

The hopelessness of the situation was reflected in pessimism among the producers. They considered possible discontinuation of control efforts.

CALFHOOD VACCINATION STARTED

At about this period, the United States Bureau of Animal Industry released information regarding the results of calfhood vaccination in their experimental herds and in others which had been using the procedure under their direction. In 1937, one producer with a herd of around 1,000 animals under supervision began vaccination of his own heifers pastured in areas remote from probable exposure to brucellosis. Vaccination with strain 19 was carried out in cooperation with the Division of Veterinary Science, University of California, and has continued as rapidly as possible until now (1942) the herd consists of approxi-

mately 55 per cent of animals vaccinated as calves.

The value of vaccination must necessarily be considered from the standpoint of both preventive medicine and animal husbandry. A preliminary veterinary report has been published,² and the following report will be confined largely to the effects of vaccination on the agglutination record of the above mentioned herd.

The source of the vaccine employed has been found to be an important factor. Only vaccines known to be equal to the United States Bureau of Animal Industry standards should be used. All vaccinated calves should show strong positive agglutination tests within 30 days or be reinoculated. When failures in the agglutination reaction are more than exceptional the vaccine should be suspected. However, positive titers following vaccination are not always proof of viability since injection of a comparatively dead vaccine or bacterin will usually result in a marked rise in titer.

The agglutination record of this herd over the period under consideration is as follows: During 1936 and the first six months of 1937, the percentage of reactors under monthly testing averaged consistently under 1 per cent. This 18-months record represents the approximate average status over the recent previous years, emphasizing the fact that monthly testing was required to maintain it. Suddenly out of a clear sky, in July 1937, the herd suffered one of those serious breaks in control, which continued 14 months to include August 1938. With a premonitory rise to 0.9 per cent in June 1937, the reactors increased rapidly and within two months had reached 3.1 per cent when bleeding at two week intervals was started and continued for five months until the reactors had dropped to 1.0 per cent. For the following seven months under monthly bleeding the average was 1.4 per cent from which point it receded to the right of the decimal. The average for the next eight months was less than 0.5 per cent.

No cause for this break could be found and 333 animals were lost from the herd. Most distressing was the fact that the infection spread violently through the dairy's

²Rosenberger, Maynard: A Dairyman's Experience in the Eradication of Bang's Disease, Proc. 44th An. Meeting U. S. Live Stock Sanitary Assn. Dec. 1940.

own heifers, which had been raised and carefully guarded in isolated pastures and periodically tested, though not vaccinated at this period, and consequently susceptible. No replacements by purchase were made. These facts emphasize the futility of depending on negative, nonimmune heifers as replacements.

RESULTS GRATIFYING

In 1939, the first of the vaccinated animals freshened and were added to the herd as rapidly as available. During 1939, reactors averaged 0.37 per cent but in 1940 they dropped to 0.28 per cent. In 1941, the herd had a remarkable record not previously attained by any of the large herds. Only eight monthly tests were made. Three of these were entirely negative and the average for the year was 0.1 per cent positive. Whey agglutination tests of 168 milk samples during 1940-1941 were all negative in dilutions of 1 : 5. The record of this dairy for 1942 is anticipated with interest.

In December 1941, the herd was entirely negative and possible lengthening of the bleeding interval was anticipated. The February test showed one non-vaccinated reactor among 1,047 animals. The March test was omitted. The April and May bleedings showed four reactors each, among 1,044 and 1,049 animals respectively. The early history of these eight cows is as follows:

Five were purebred, show heifers which were purposely not vaccinated for fear that they would fail to lose the initial positive titer in time for them to enter the show circuit. They had been negative for several years in the routine, herd tests. Two of the remaining were grade heifers which were part of a group not vaccinated at the start of the program. The eighth animal was a producing non-vaccinated purebred purchased from a distant certified dairy with a completely negative abortion infection record.

The historical record of these animals would seem to stress the value of calfhood vaccination in this herd and to justify the belief that the dairy farm was heavily contaminated with brucellae and made the success with more than 550 vaccinated replacements more striking. Of these 550 animals accepted into the herd as successfully vaccinated, four have later shown reactions to the agglutination test. Two gave suspicious reactions (1-100) and passed out of our control. The remaining two gave full positives (1-200) and a year later were strongly positive. While it has been ob-

served that animals accepted into other herds practicing calfhood vaccination have later shown transient suspicious positive reactions and subsequently cleared up, under the circumstances outlined above, all four animals (0.72%) must be accepted as failures of vaccination to permanently protect against infection in this dairy.

Two other large dairies with histories similar to that of the dairy mentioned, later began vaccination. By 1943 their proportion of immunized animals in their producing herds will be considerable.

It is admitted that the ultimate evaluation of vaccination in brucellosis control and elimination must be judged from the results of a long term program. Data obtained from small experimental herds may differ from that found in large commercial herds.

SUMMARY AND CONCLUSIONS

The experience, herein presented, covering 14 years of effort in brucellosis control in herds which are among the largest in the country has led to the following conclusions:

1. Attempts to eliminate brucella infection by test and removal is economically unsound and offers no prospect of permanent eradication unless supplemented by calfhood vaccination.

2. The practice of establishing herds composed of unvaccinated heifers raised under disease free environments has not been successful; such animals proved highly susceptible to the disease when induced into milking strings.

3. The possibility of dairy herds consisting of animals having definite immunity to brucellosis may eventually be realized through calfhood vaccination.

ACKNOWLEDGMENTS

We wish to acknowledge the value of continued aid and coöperation extended by several members of the Division of Veterinary Science, University of California, and Dr. Karl F. Meyer of the George Williams Hooper Foundation. Dr. Meyer also kindly assisted in the compilation of this paper.

The Los Angeles Certified Milk Commission is greatly indebted to the University of Southern California for laboratory quarters and other valuable assistance rendered over the past ten years.

SURGERY & OBSTETRICS

AND PROBLEMS OF BREEDING

Diagnosis of Pregnancy in the Mare by Hormonal Means

H. H. COLE, Ph.D., and G. H. HART, V.M.D.

Davis, California

THERE ARE SEVERAL methods available for the diagnosis of pregnancy in the mare. Diagnosis by rectal palpation of the uterus has a decided advantage in that the result is available at once without the need for laboratory tests. Its disadvantage is that it is only accurate in the hands of a skillful and experienced person. Dimock and Fincher¹ have increased the accuracy by combining vaginal examination with rectal palpation. Vaginal examination discloses the presence of dry sticky mucin in the vagina and cervix of pregnant mares. Day and Miller² have used a vaginal mucin test, first proposed by Kurosawa, in which smears taken from the surface of the cervix show a marked affinity for stains and special cellular constituents when pregnancy exists. Day and Miller state that the mucin test can be used from the end of the fourth week to the end of pregnancy. They report an accuracy of about 80 per cent prior to the seventieth day, and of 95 per cent during the remainder of pregnancy. Many will prefer to continue the use of these rapid methods, either exclusively or in conjunction with blood and urine tests in certain doubtful cases—others may prefer to adopt the use of biological tests dependent upon the presence of certain hormones in the blood and urine.

Highly accurate hormonal methods of

pregnancy diagnosis are available. We have made several hundred blood-serum tests and have yet to find a pregnant mare which gave a negative test during the appropriate period. Two or three positive tests have been encountered in which the mare failed to foal but these are almost certainly cases in which early abortion or resorption of the fetus occurred. Evidence of resorption is based upon the fact that gonadotropin appeared in the blood at the expected time after breeding, nearly rose to the usual high concentration, and then dropped more rapidly than in the blood of mares which carried fetuses to term. We believe this rapid drop is associated with the death of the fetus. The fact that similar concentrations of hormone have never been encountered in unbred mares leads us to conclude that a pregnancy was initiated but terminated too early to result in abortion. While positive proof is lacking, we believe that early death of the embryo results in resorption. Other workers using hormonal tests believe that such cases should be interpreted in this light rather than failure of the method of diagnosis.

Varley³ reports that the results from using the serum test were better than 95 per cent accurate in several hundred mares. He reports obtaining borderline positive responses from two nonpregnant mares with cystic ovaries. Cole and Goss⁴ demonstrated gonadotropic hormone to be present

From the Division of Animal Husbandry, University of California.

¹Dimock, W. W., and Fincher, M. G.: Early Examinations for Pregnancy in the Mare. *Cornell Vet.*, xviii (1928), pp. 49-54.

²Day, F. T., and Miller, Wm. C.: A Comparison of the Efficiency of Methods of Diagnosing Equine Pregnancy with Special Reference to the Mucin Test. *Vet. Rec.* lli (1940), 40, pp. 711-716.

³Varley, J. R.: Application of Equine Pregnancy Test. *Cornell Vet.*, xxviii (1938), pp. 86-90.

⁴Cole, H. H., and Goss, H.: Gonadotropic Hormone in the Nonpregnant Mare. *Am. J. Physiol.*, cxxvii, (1939), pp. 702-709.

in the blood of nonpregnant mares in minute amounts. They found that 100 to 200 cc. serum-equivalent of extracts were necessary in most instances to produce a positive reaction with a few cases giving positive responses at 30 cc. serum-equivalent levels, and a few others still negative when the equivalent of 400 cc. of serum was injected. The very poor results obtained with the serum test by Day and Miller² when serum was drawn between the 50th and 120th days of pregnancy—31 wrong diagnoses out of 245—can only be explained on the basis that their test animals or procedure were not sufficiently standardized.

In an earlier report, we⁵ advocated the use of blood serum throughout pregnancy. The work of Zondek⁶ made it apparent that the urine would be a more satisfactory test material in late pregnancy because of its high estrogen content. We now recommend the use of blood serum from the 45th to the 140th day after the last breeding date, and the use of urine from the 140th day to term. In early pregnancy, the test is based upon the presence of increased concentration of gonadotropin in the blood; in late pregnancy, upon the presence of estrogen in the urine. Briefly stated, gonadotropin stimulates the gonads—ovaries or testes; estrogens stimulate the accessory reproductive organs: oviduct, uterus, vagina and mammary glands. Since gonadotropin stimulates the production of estrogen by the ovary, there is a response both in the ovary and in the accessory reproductive organs following the injection of gonadotropin.

Figure 1 shows the actual amounts of the two hormones, gonadotropin and estrogen, found in the blood and urine respectively, at various stages of pregnancy in mare C8. At the 140th day, gonadotropin is still present in the blood and estrogen has entered the urine. At this particular stage of pregnancy, therefore, either test is effective.

Diagnosis of Pregnancy between the 45th and 140th Day after Breeding.—Three to six ounces of blood should be drawn from the jugular vein into a clean, dry and preferably sterile bottle. If the clot adheres to the side of the bottle, it should be loosened without contamination to facilitate the separation of the serum. It is desirable to allow the blood to stand at room temperature for 1 to 2 hours so that the serum will come off more completely before putting it in the refrigerator. It may be shipped if desirable, without further treatment, but a more satisfactory procedure is to pour off the serum into an ounce bottle, cool in the refrigerator, wrap the bottle with paper to keep cool, place in a carton and ship. It is essential that the samples be adequately labeled, preferably with the name of mare, name of owner, date of bleeding and the date of the last breeding. The name of the mare and the name of the owner could be substituted by a serial number assigned by the veterinarian. If the "date bled" and the "date bred" are given, the person making the biological test can better interpret it. The ovarian weight of the test animal is dependent upon the amount of hormone in the blood injected. The variations of concentration of this hormone in the blood are shown in figure 1. This concentration variation is the reason why the breeding date is essential. For instance, if a barely positive response is attained with a sample presumably drawn at 70 days after breeding, one immediately becomes suspicious either that there is an error in the stage of pregnancy or that resorption of the fetus is taking place, for one would expect to get a clear-cut response at this stage.

The presence of gonadotropin in the blood, which is the basis for positive pregnancy tests from the 45th to 140th day, can be determined by several methods. The hormone has an effect upon the gonads of all vertebrates; consequently, the use of a wide range of animals has been suggested. More information is available, however, in regard to immature rat tests and the rabbit

²Hart, G. H., and Cole, H. H.: A Practical Method for the Diagnosis of Pregnancy in the Mare. J.A.V.M.A., lxxx, (1932), pp. 604-614.

⁶Zondek, B.: Hormonale Schwangerschaftsreaktion aus dem Harn bei Mensch und Tier. Klin. Wchnschr., 9, (1930), pp. 2285-2289.

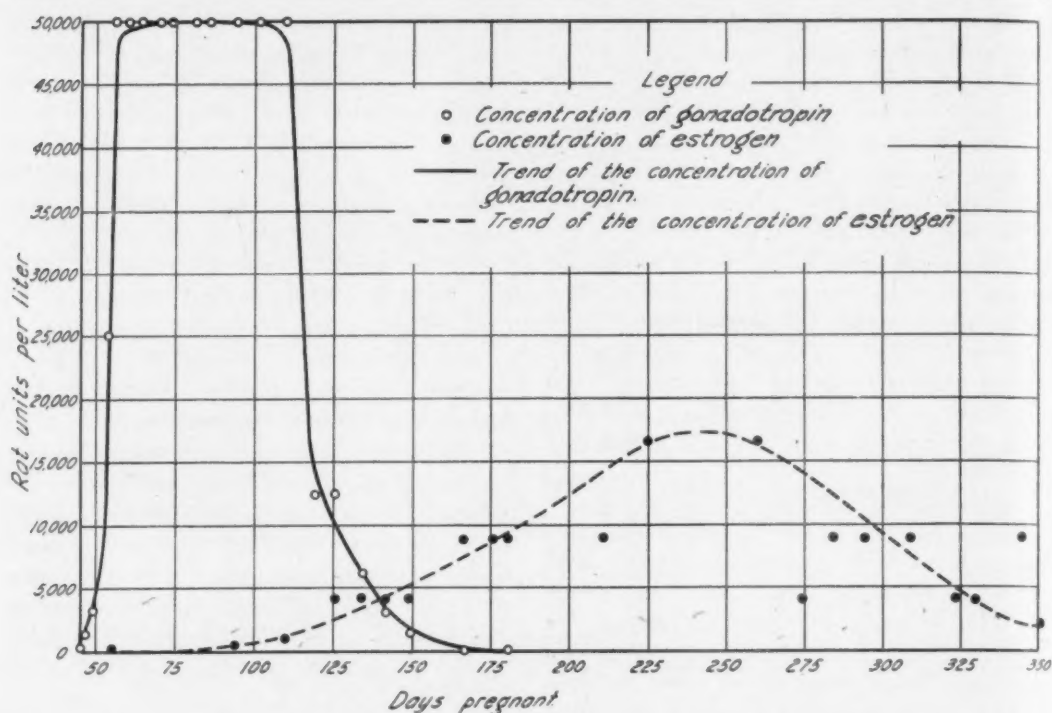


Fig. 1—The concentration of gonadotropin in blood serum and of estrogen in the urine of mare C8 throughout pregnancy.

ovulation test, and thus we shall limit our discussion to these:

1. *The 96-hour immature rat test.*—Immature female rats 21 to 25 days old are used. We recommend a single subcutaneous injection of 5 cc. of serum for each of 2 rats. Ninety-six hours after the injection, vaginal smears are taken, the rat sacrificed, and the ovaries examined and weighed. A vaginal smear of estrus is indicative of a positive response and in most, if not all instances, a correct diagnosis can be made with the smear alone (see Hart and Cole⁶ for a description of vaginal smear changes in the rat). The presence of ripe follicles or corpora lutea in the ovaries, or an increase in ovary weight, as well as an enlarged uterus give added assurance to the correctness of the test. The weight of ovaries from non-treated rats at this age will vary with the strain of rats—in our colony, the average weight is 20 mg. with a range of 10 to 30 mg. in individual rats at 29 days of age.

2. *The 48-hour immature rat test.*—This new method has the advantage of reducing the time by one half. The age of the rats, route of injection and dosage are the same as for the 96-hour test. However, as the reading of the test is quantitative rather than qualitative, one should use at least 4 rats for each test. The test is based upon the fact that the injection of gon-

adotropin will result in a significant increase in the size of the ovaries and uterus within 48 hours—the increase in uterine weight is an indirect response dependent upon secretion of estrogen by the ovary of the injected rat.⁷ When this more rapid method is used in the diagnosis of pregnancy, serum from pregnant mares will cause an increase of at least 100 per cent in the uterine weight over that of control rats sacrificed at the same age. The uterus should be severed at the vaginal end of the cervix and the fluid, which accumulates in the uterine cavity of rats giving a positive response, is not withdrawn before weighing. The uterine and ovarian weights of the normal control rats must be established once for the particular strain being used. An increase of at least 50 per cent in ovarian weight over that of the ovaries of control animals is equally indicative of a positive response. However, if the blood is drawn at the 45th day or at the 140th day, the amount of hormone in the blood may be too small to have a significant effect upon the ovaries. Figure 2 shows the ovarian and uterine responses to increasing dosages of equine gonadotropin. From this, one can see that the uterus is much more sensitive to small

⁷Cole, H. H., and Erway, J.: 48-hour Assay Test for Equine Gonadotropin with Results Expressed in International Units, *Endocrinology*, xix, 1941), pp. 514-519.

amounts of this hormone than are the ovaries. This being true, one may ask logically why the ovaries are not disregarded. It is our belief that they may be, for we have never obtained a positive uterine response with 5 cc. of serum from a non-pregnant mare, but a significant increase in ovarian weight always adds assurance to the accuracy of the test. Figure 2 shows that a significant ovarian increase is obtained with as little as six units. Referring back to figure 1 will show that distinct ovarian increases should therefore be expected between the 50th and 120th day. Between the 45th to 50th and between the 120th to 140th day, one may occasionally encounter positive uterine and negative ovarian responses in pregnant mares.

The necessity of using rats of fixed age and known strain for this test cannot be overemphasized. There are great variations in size and time of sexual maturity of different strains of laboratory rats, and consequently, different strains will show considerable variation in ovarian and uterine weights. Standardized methods of dissection and weighing must also be adopted.

Because of these precautions, this test may appear to be difficult. Actually, after considerable experience with the test, a reliable laboratory assistant will be able to read the 48-hour response qualitatively without the necessity of dissection and weighing. This is accomplished by noting the enlargement of the ovaries and uterus, and the increased size of the ovarian follicles.

3. *The rabbit-ovulation test.*—Mature, non-pregnant rabbits which have been isolated both from males and from other females for 21 days, or 2- to 9-day postpartum rabbits should be used. Ten cc. of serum are injected intravenously in the marginal ear vein into one, or preferably two rabbits. According to Magnusson,⁸ the test is 98 per cent accurate between the 49th and 84th day after breeding. Twenty-four to 48 hours after injection, the ovaries of the rabbit are examined by laparotomy or autopsy. A positive test is recognized by the presence of freshly ruptured follicles with cone-shaped rupture points, whereas unruptured follicles are found in negative cases. It is our belief that more difficulty will be encountered with the rabbit test than the rat test, though if the dates and method suggested are rigidly adhered to, one should expect equally good results by either method between the 49th and 84th day. The rat is more sensitive to the hormone than is the rabbit, this fact explaining why the rat test is effective over a wider

time range. Females must be kept separate from their own sex to prevent sexual reflexes from causing rupture of follicles.

Diagnosis between the 140th Day and Term.—During this period, urine is used. About 2 oz. of urine are collected in a clean container, either by catheterization or by

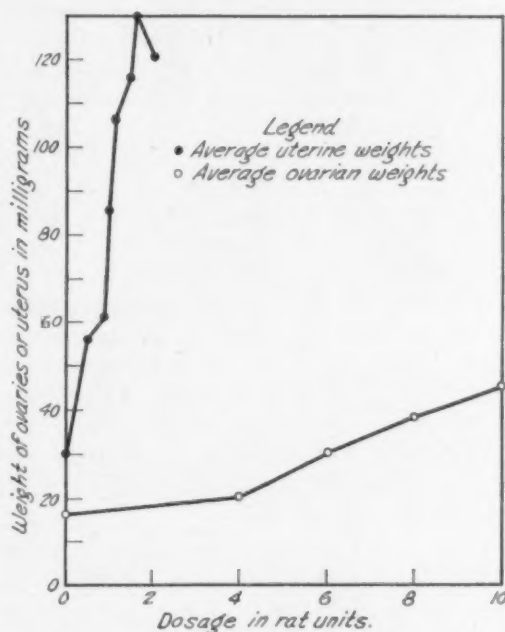


Fig. 2—The average weight of the ovaries and uteri of rats receiving varying dosages of equine gonadotropin (8 rats at each injection level). The rats were autopsied 48 hours after a single subcutaneous injection on the 27th day of age. Note that one-half rat unit had a marked effect upon the uterine weight, whereas the ovarian weight did not increase markedly until 6 rat units were administered.

collecting voided urine. Pregnancy is determined by the presence of estrogen in the urine, which may be recognized either by the spayed rat test or by the chemical test. Estrogen has an effect upon the accessory organs of a wide range of animals, but the spayed rat and mouse have been most widely used as test animals.

1. *The spayed rat test.*—Our procedure for this test is as follows: Sexually mature rats are spayed and may be used any time between the 10th and 150th days after the operation but at least 10 days should elapse between test periods for a given animal. Three rats each are injected in the morning and late afternoon of the first day, and in the morning of the

⁸Magnusson, H.: Die Trächtigkeitsdiagnose bei Stuten nach der Friedman-Schneiderschen Methode (FSR). Zeitschr. f. Infektionskrankheiten, parasitäre Krankheiten und Hygiene der Haustiere, xlviii, (1935), S. 155-184.

second day with 1 cc. of urine, *i. e.*, each rat will receive a total of 3 cc. Sixty hours, and again at 72 hours after the first injection, vaginal smears are taken. An estrous smear is indicative of a positive response. If all rats are positive, the mare can be considered to be pregnant. If one or two rats are negative, preferably a retest should be made about one week later. Almost invariably a positive response is obtained in all three rats injected with urine from pregnant mares in the specified period.

2. *The chemical test.*—Our procedure is a slight modification of the Cuboni method⁹: Acidify 5 cc. of urine with 1 cc. of concentrated hydrochloric acid. Place in a boiling water bath for 10 minutes, cool and extract with 6 cc. of benzene. Dry 3 cc. of the extract at 60 to 80 C. Add 4 cc. of concentrated sulfuric acid to the residue and warm in water bath to 70 to 80 C., and read the results in 10 minutes.

Extracts of urine from pregnant mares will give a green fluorescence in reflected light, whereas those from nonpregnant mares will be reddish-brown. Very frequently, there will be a very slight greenish tinge in extracts from nonpregnant mares but no difficulty should be experienced in differentiating the two.

Our experience with the spayed rat test and the chemical test has not been as extensive as with the rat test for gonadotropin. Cuboni obtained correct positives in 35 pregnant mares and obtained negative results in all nonpregnant mares which he tested. Day and Miller² obtained very poor results with the biological test—19 incorrect results in 219 tests. In another series, they report 43 wrong negative results in 207 examinations. Their poor results with the biological test based upon the presence of estrogen in the urine is equally as baffling to explain as similar results based upon the presence of gonadotropin in blood serum. Anderson¹⁰ had an error of only 1.2 per cent in 343 mares, using the biological test for estrogen. Schramm¹¹ made a total of 4264 tests of blood and urine samples. The Cuboni method yielded 94 per cent correct results after the 120th

day. Svensson¹² tested 142 mares with Cuboni's chemical test with an error of 2.86 per cent. Simultaneous biological tests gave an error of 5.26 per cent. Lütje and Buhse¹³ found an error of 4.7 per cent in 485 mares using the chemical test.

SUMMARY AND CONCLUSIONS

Several procedures are given for the diagnosis of pregnancy by hormonal means, including a new 48-hour rat test based upon the presence of gonadotropin in the blood. Inasmuch as this test is equally as sensitive to gonadotropin as the 96-hour test, it should prove to be equally as accurate, providing sufficient care is exercised. Most investigators find that the rat test between the 45th and 120th day does not have an error in excess of 2 per cent. Our opinion that some apparent false positives obtained during early pregnancy are due to resorption or early abortion is shared by most investigators making extensive studies on the biological tests for pregnancy. The error in pregnancy diagnosis from the 140th day to term, based upon the presence of estrogen in the urine, falls between 1 and 5 per cent in the hands of most workers.

These hormonal tests can serve in confirming results obtained by rectal palpation, or by the vaginal mucin test which are doubtful. Those who are not experienced with these latter methods may wish to use hormonal methods exclusively.

⁹Schramm, W.: Die Trächtigkeitsfeststellung bei der stute durch eine biologische und eine chemische Methode. Zeitschr. f. Infektkr. Haustiere liv (1938), 57-76.

¹²Svensson, S.: En kemisk-hormonal dräktighetsreaktion för sto. Skand. Vet. Tidskr., 26, (1936), pp. 550-556.

¹³Lütje, and Buhse, W.: Erfahrungen über Trächtigkeitsfeststellungen bei Stuten mit der Cuboni-Reaktion. Dtsch. tierärztl. Wchnschr., 47 (1939), pp. 581-587.

According to specialists of the Texas A. & M. College, it would take 6,000 freight trains of 50 cars each to haul the fats consumed annually by American families. . . . It is imperative to conserve fats and oils. There is a world shortage of them.—*From The Cattleman.*

⁹Cuboni, E.: Über eine einfache und schnell chemisch-hormonale Schwangerschaftsreaktion, Klin. Wchnschr., xlii (1934), s. 302-303.

¹⁰Anderson, J.: Report on the Biological Urine Test for the Diagnosis of Pregnancy in the Mare. Vet. Rec., llii (1941), pp. 251-252.

Perforating Peptic Ulcer in a Dog

GERRY B. SCHNELLE, V.M.D., and MYRON S. ARLEIN, D.V.M.

Boston, Massachusetts

PEPTIC ULCER is a relatively common disease of man, particularly in the male and less frequently in the female. Dogs have been strikingly refractive to the development of this lesion, both spontaneous and experimental.

Etiology.—No single factor has ever been proved to be the cause of peptic ulcer. A cursory review of some of the extensive literature on the subject indicates that the numerous etiological theories are controversial and speculative.¹ Various combinations of factors may be responsible for an individual case. Both predisposing and exciting conditions contribute to the production of this lesion. The etiological factors have been summarized in one review of literature to be mechanical, chemical, thermal or bacterial. Mucosal susceptibility is also included in the summary as a predisposing condition.

Some investigators believe that an interference with the arterial blood supply to the pyloric third of the stomach is a forerunner to the development of peptic ulcer. This abnormal physiology may be arterial and capillary spasm, bacterial emboli, arteriole and capillary endarteritis, or blood chemical changes with resultant blanching of a circumscribed portion of gastric mucosa. This disturbance in chemical balance of the mucosa breaks down the barrier of this section of tissue to the proteolytic reaction of hydrochloric acid and pepsin with resultant ulcer formation.

Such factors as trauma and gastritis are well recognized for their possible relationship to the cause. Neurogenic causes have also been indicted for their rôle in the etiology of this disease. Boyd² states that peptic ulcer is due to an infection of the

stomach wall in an area of lowered resistance.

Symptoms.—The outstanding symptom of peptic ulcer is pain that occurs within a classical sequence. The four phases of this series are food, comfort, pain, and comfort, which may occur at regular or irregular intervals. Appetite and vomiting are variable symptoms and are not recognized as conclusively diagnostic signs. An early diagnosis is difficult since the syndrome is not characteristic. Hemorrhage, perforation, and obstruction due to pyloric stenosis are described as important complications.

Case History.—The patient was a 6-year-old male Boxer that had been presented to our clinic on occasions throughout its lifetime for various minor ailments, none of which were considered relevant to the dog's subsequent death.

Prior to the fatal termination, the owner had observed infrequent attacks of presumably abdominal distress that she termed "indigestion." There was no history of vomiting. On the day of the dog's death it was fed a meal consisting mostly of meat. Within two hours marked restlessness was noted in the animal's behavior. This was followed by anxiety and pain. The pain increased and while the owner was attempting to secure veterinary aid, she held the dog's head in her lap. This seemed to induce rest but by midnight the dog had died without further indication of pain. The body was presented for autopsy the following morning. The postmortem findings follow:

Autopsy Report.—Visible mucous membranes were purplish in color. The skin over the ventral abdomen was taut from distention and discolored with purplish blotches. Generally, the carcass appeared to be in a good state of nutrition.

On incision of the abdominal cavity, a large amount of gas was released. About

From The Angell Memorial Animal Hospital, Boston, Mass.

¹Gaither, Ernest H.: Peptic Ulcer, Nelson, Loose Leaf of Living Medicine, 5: 239-262, 1941.

²Boyd, William, A Textbook of Pathology, Lea & Febiger, Philadelphia; third edition, p. 526, 1938.

six ounces of partially digested food were scattered throughout the peritoneal cavity. An acute hemorrhagic peritonitis involving both the parietal and visceral peritoneum was evident.

The serous surface of the stomach close to the ventral center of the greater curvature was perforated with an opening about 1.5 by 0.75 cm. The perforation was a well-defined ulcer. The edges were smooth with a hemorrhagic ring between the gastric mucosa and serosa. The edge of the



Serous surface of the stomach showing ulcer perforation.

ulcer had a funnel appearance extending from the larger serosal circumference to the mucosa. Regional lymph nodes were enlarged and hemorrhagic.

Septicemic lesions secondary to the peritonitis were present. These were petechial and ecchymotic hemorrhages in the kidneys, pancreas, spleen, intestinal tract, lungs, pleura, and lymph nodes. The liver was markedly decomposed by postmortem fermentative processes.

Microscopic Description.—The stomach was submitted to Dr. S. Burt Wolbach (Harvard University Medical School) for histopathological study. His report was as follows:

Sections were made from a block of tissue taken through the sloping border of the ulcer which was directed toward the pylorus. Post-

mortem changes had obscured fine details and it is quite evident that any exudate and necrotic material had been removed by postmortem digestion.

The findings of interest were the very considerable degree of cicatrization of the muscularis surrounding the ulcer, a dense cicatrization of the submucosa for a distance of almost a centimeter, surrounding the ulcer. The walls of the ulcer itself were mainly cicatricial tissue and there was likewise a marked cicatrization of the subserous fat. Evidence of earlier reparative processes were present in the form of many small blood vessels parallelly arranged and extending to the wall of the ulcer. There is one artery of considerable size in the subserous fat, showing a fairly marked degeneration of the media with connective tissue replacement of the smooth muscle, and calcification. Small arteries in the muscularis and submucosa showed varying degrees of degeneration and atrophy of the muscle cells of the media with connective tissue replacement.

Comment:—The walls of this ulcer bear considerable resemblance to those of chronic peptic ulcer in the human being, although the degree of cicatrization surrounding the ulcer is much less. We can be certain, however, that the ulcer existed for a considerable time before perforation because of the cicatrization of the surrounding submucosa, muscularis and subserous fat. It is reasonable to hypothecate that the genesis of this ulcer was occasioned by factors similar to those responsible for peptic ulcers in man.

Pregnancy Disease of Ewes

J. W. Hall Masheter, M.R.C.V.S. (*The Veterinary Record*, April 4, 1942), reports the recovery of seven ewes affected with so-called pregnancy disease from daily subcutaneous injections of acetylcholine bromide in doses of 1 cc. Of the seven cases, five were cured after receiving one dose, and the other two required two doses. Though the number of trials was small, the author concluded that the use of choline preparations "seems to be a rational procedure." Many of a flock of 200 ewes had died before the treatment was employed. The cures were attributed to the action of acetylcholine on the parasympathetic system (increased secretions, vasodilatation, hypotension, bradycardia, and smooth muscle stimulation).

Food will win the war and write the peace.—*Secretary Wickard.*

Hermaphroditism in a Dog

GEORGE H. LUDINS, D.V.M.

Hartford, Conn.

THE SUBJECT was a Collie-German Shepherd cross, 10 months old, weighing about 50 pounds. This dog was brought in for spaying, and was admitted by the attendant. The owner was not aware of any abnormality, believing the dog to be a true female.



length, and contained a well-developed os penis and a perfectly formed bulbus glandis capable of erection. There was no urethra in the penis nor sign of grooving in the os penis.

The urethra was finally located on the dorsal wall of the vulva, and the opening was apparently a large one, as the urine gushed forth on abdominal pressure.

No attempt at surgery was made, as the writer could not decide whether the animal was a male or a female, the final decision being that the sexes were neatly balanced.



Upon examination, it was noticed that what appeared to be an abnormally large clitoris was protruding from the vulva. The area was clipped, and directly adjacent to and to the right of the vulva, there was a testicle slightly smaller than normal for a dog of that age and size.

The scrotum showed no median line, being apparently only half a scrotum. The ventral aspect of the abdomen appeared normal for a female with about the normal mammary development for that age. There was no sign of a prepuce, unless the vulva could be regarded as such.

The penis was about $1\frac{1}{2}$ inches in

The owner was prevailed upon to make this dog available for study by a qualified person or institution. Anyone interested may communicate with the author.

Shortage of vitamins A and B₁ can become more deadly to the world's population than all the explosives the factories can turn out.

Index of Clinical Material— Torsion of the Uterus

I appreciate the JOURNAL and look forward to receiving it each month. I am interested mostly in articles that will help practitioners and have kept an index of such material gathered from veterinary publications since 1925. When needing to "brush up" on any subject, I can put my hands on anything published in the JOURNAL, *Veterinary Medicine, North American Veterinarian* and various house organs in recent years.

In regard to "Torsion of the Uterus" [Vide, the JOURNAL, June 1942, pages 494-495], I have two principal methods of handling it: (1) invasion through the right flank and (2) rolling the cow over with the hand in the uterus. Often one can not insert the hand through the cervical canal. Recently, in that event, I hung the cow up by the hind legs after protecting them against injury by wrappings of gunny sacks and was surprised to find that the womb straightened up enough to admit the hand. By twisting and rolling her body, which was easy with the shoulder on the floor, the torsion was neatly untwisted, and the calf delivered.

I also find that lifting the body in this fashion in dystocia, repulsion is much easier and seldom necessary. When the deviation of the head and legs has been corrected, the body is lowered to complete the delivery.

I also find epidural anesthesia useful in prolapse of the uterus. It not only saves work but also reduces pushing and squeezing to the minimum, and the danger of perforation is nil.—O. W. Johnson, D.V.M., Davenport, Wash.

Sportsmen furnish 250,000 tons of food each year in the form of game birds, game animals, and game fish.—*Science News Letter*.

Surgical Treatment of Teat Fistula*

Contrary to the general belief, congenital teat fistulas are of more frequent occurrence than those caused by wounds. The advice to handle these by simply snipping of the teat in calfhood is not practiced because congenital fistulas are not generally noticed until the heifer is springing. There are those which communicate with the teat canal and others, located higher up, which open exteriorly as the outlet of a separate gland. The mechanism of the teat fistula is a supernumerary teat fused in embryo with the main teat.

The operation is done when the cow is in a standing position and is completely dry, if possible six weeks before calving. Except in nervous cows, where a kicking strap is needed, all the restraint required is to have the helper hold the head and nose. The locale is anesthetized with procaine, 1 to 2 per cent, injected just above the orifice. A straight probe is passed into the fistulous duct. An incision $\frac{1}{4}$ in. long is made upward, parallel to the duct and then continued around the orifice, including a small margin of skin, and the end of the fistula dissected out and cut off. The wound is closed with two sutures and painted with tincture of iodine, daily, for four or five days. Provided one makes certain that the cow is quite dry before operating, excellent results may be expected.

The cost of war runs into fantastic figures. An airplane of the bomber type, for example, costing around half a million dollars is good only for about 20 combat flights, if not previously destroyed. With the cost of maintenance (airfield repairs, etc.) every raid made costs approximately \$50,000 for each plane. If the cost of training the personnel were added, the figures mount still higher.

*A. S. Harris, Operation for Milk Fistula, The Veterinary Record, March 28, 1942, page 129.

NEW DATES AND HEADQUARTERS FOR 79TH ANNUAL
MEETING: AUGUST 24-27, 1942—PALMER HOUSE, CHICAGO
SEE PAGES 83-87

CLINICAL DATA

Blood Substitutes

The following named substances may be used to restore lost blood volume or keeping blood from pooling: whole blood (preferably homologous), physiological salt solution, glucose solution (5%), Ringer's solution, diluted gum acacia, solution of red fluid. The blood bank of dried blood plasma, isinglass (7%), pectin (1%), peritoneal fluid. The blood bank of dried blood plasma because it can be quickly reconstituted when needed is, however, replacing these blood-volume restoratives.

Typhus Vaccine Under Critical Test

The Journal of the American Veterinary Medical Association, December, says that the U. S. Public Health Service has received word from Hungary that the American type of typhus vaccine taken to Budapest last spring by Doctor Eichhorn of the Bureau of Animal Industry has been used on two "guinea pig" communities. It will be recalled that this vaccine affords complete protection in test-tube experiments, but, as the dispatch says, there is no final test of a typhus vaccine except an epidemic. —*From Daily Digest, USDA.*

Mammary Rest in Mastitis

Dr. W. F. Guard, author of "Mammary Rest in Mastitis" page 161 of the February 1942 issue of the JOURNAL desires paragraph 4 of the article to read:

"If quarters affected are injected with certain preparations while lactating, some cows have been known to practically cease lactating in all quarters for the remainder of the lactation period. Consequently, some are recommending that such preparations be used only on dry quarters. Under such circumstances, one wonders how much of the credit should be given to the particular product and how much to the period of rest."

Brucellosis from Goats in Mexico

A study of the increasing number of cases of brucellosis in Mexico City incriminates the drinking of goat's milk as the main etiologic factor. Of 150 blood samples classified by Castaneda, Tovar and Velez (Abst. J.A.M.A., June 27, 1942), 143 were of *Brucella melitensis*, 5 of *Br. abortus* and 2 of *Br. suis*. Epidemiologic data collected indicated that dairy products from goats was the main source of the infection.

Cow's Urine in Coccidiosis of Chickens

Due to certain claims regarding the efficacy of cow's urine as a preventive of coccidiosis in chickens, studies were undertaken under laboratory conditions. Cow's urine and fractions thereof, as well as urea, were fed to chicks inoculated with a lethal dose of *Eimeria tenella*. In no case did the urine or urea indicate any significant protection.—*Fisher, Inkster and Biely, American Journal of Veterinary Research, Apr. 1942.*

Glucose in Acetonemia*

It is apparent that in order to promote rapid and permanent recovery from severe ketosis (in cows), glucose must be administered at frequent intervals and in substantial quantities over a period of time. Although pumping large quantities of glucose into the rumen produces a marked and immediate antiketogenic effect, such treatment is often inadequate because of the adverse effect it has upon the appetite. Adding glucose or its equivalent to the feed would appear to be the most logical method of carbohydrate therapy.

*Shaw, Howell and White, the JOURNAL, June, 1942, p. 477.

Fern Poisoning in Texas*

The disease of sheep, goats and cattle popularly named "jimmies" has been reproduced experimentally by workers of the Texas Agricultural Experiment Station with the coöperation of the U. S. Bureau of Animal Industry. The toxicosis was found to be caused by grazing the fern, *Notholaena sinuata* var. *crenata*, which flourishes

sudden death both of which are brought on by exercise. There are no losses in cattle and the losses in goats are slight. It has never been seen in horses. On these accounts, the remedy is to use the pastures for goats, cattle and horses.

Suddenness of attack in animals exercised not earlier than 48 hours after consuming the fern is a characteristic of both spontaneous and experimental toxication. Goats when poisoned appear to save themselves by wisely standing still while sheep walk and die. A circumstance under which the accident commonly appears is when a new pasture containing the fern is

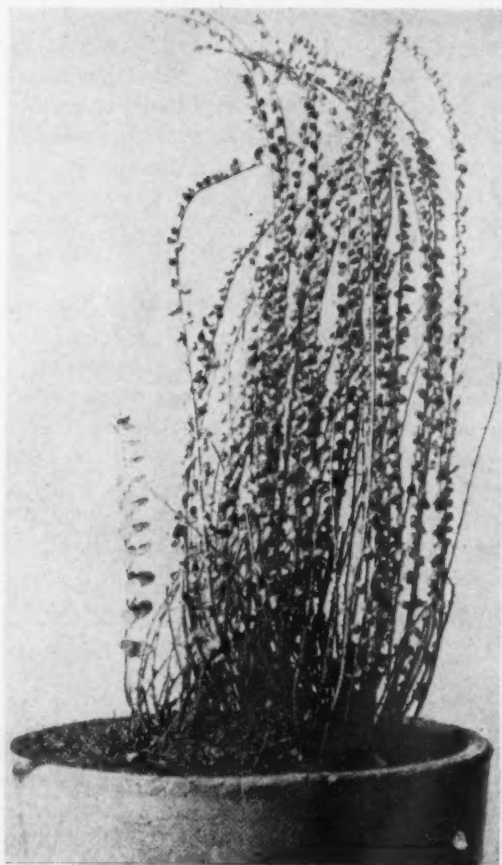


Fig. 1.—The Fern, *Notholaena sinuata* var. *crenata*, cause of "jimmies" of the Trans-Pecos.

from central Texas to California. With the moving westward of sheep raising, the disease has become one of the leading problems of the involved area. Deaths begin to occur in the middle of November and continue until green grasses become available in the spring. The symptoms are trembling and

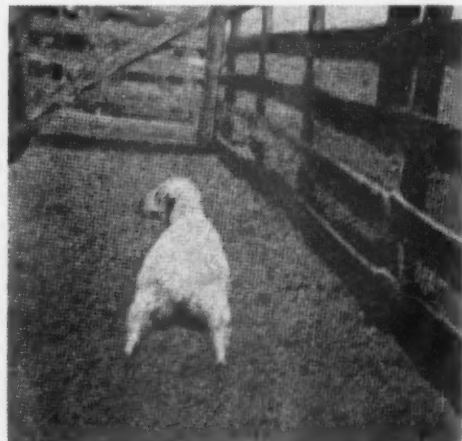


Fig. 2.—A case of "jimmies" showing the animals inability to advance the hind limbs.

worked and the flock is driven to water a mile or so. Certain numbers of such animals stop, tremble from head to foot, lie down for 15 to 30 minutes and then follow the main herd to arrive at the corral a short time later. The severity of the symptoms increases as the dangerous season advances. By the middle of January a number of dead sheep may be found along the trails. Evidently the deaths are sudden, as there is no evidence of struggling where the victims fall. At this time, there are a number of stragglers as the flock drifts to water. This evidence is characteristic. The mortality may now run as high as 10 per cent. Sheep apparently healthy may be stricken

*Abstract from Bulletin No. 611, Texas Agricultural Experiment Station, April, 1942.

Three Common Toxic Plants

Water hemlock (*Conium spp.*), wet land shrub, common in practically all parts of farming and grazing areas of the United States is one of the deadly toxic plants to reckon with in veterinary practice. Its usual abode is along streams and ditches where moisture is never lacking. The most toxic parts of the plant are the small shoots and the roots. The greatest danger arises in the early spring and again in the fall when grass runs short. It poisons cattle and sheep. Hogs are poisoned from eating the roots during their habitual subsoil rootings. The symptoms of poisoning are nervousness and trembling followed by severe convulsions of a fatal nature.

Cocklebur (*Xanthium sp.*), also a stream- and ditch-bank plant, is well known for the toxic nature of the early shoots. The hazard is greatest in the spring when the shoots spring up exuberantly in grassless hotlots, as the plant loses its toxicity after the two-leaf stage of its growth. The main symptom of poisoning is staggering. Fatal

cases die in convulsions more noticeable about the head and neck (throwing the head back). The accident is easily recognized by the presence of the cause where the injured pigs are running.

White snakeroot (*Eupatorium urticaefolium*, formerly *E. ageratoides*) is a common, poisonous plant of the Middlewest, a one-time scourge of Ohio, Indiana and Illinois and an ever-existing menace where pains are not taken to prevent exposure. It grows exuberantly along the border of shaded places and is eaten by livestock when edible grasses run short. It poisons cattle, horses and sheep and is toxic for man through the drinking of milk and the eating of butter from poisoned cows. The toxic principle is named trematol for trembles, the name given to the intoxication in man. The symptoms of poisoning in animals are weakness, tremblings, exhaustion which may end fatally in a few days or run a more lingering course according to the amount consumed.

Three Common Toxic Plants

Left to right: Water Hemlock, Cocklebur, White Snakeroot.



(Continued from preceding page)

when driven 100 yards with little warning of approaching trouble. Toward the end of the season (spring) the jimmies-affected flock lack coördination of movement on all fours. The hind legs can not keep up with the fore ones with the result that the animal falls with the hind limbs back and the fore ones forward (fig. 2).

Ranchers report that the symptoms are approximately the same in cattle with the exception that they recover and are able to follow the main herd. The symptoms in goats are rapid switching of the tail, stilted gait, rapid breathing and trembling. If death occurs it is sudden as in sheep.

The Toxicity of Foliage of *Aleurites Fordi* for Cattle

M. W. EMMEL, D. A. SANDERS, AND L. E. SWANSON

Gainesville, Florida

DURING NOVEMBER 1941, 14 deaths occurred in a herd of 44 purebred Hereford and Aberdeen-Angus cattle which were confined in a 20-acre improved pasture. All of the animals showed similar symptoms. Four of them died three to four days after the onset of symptoms. These animals showed a hemorrhagic diarrhea, atony of the rumen, loss of appetite, listlessness and an unthrifty appearance. The body temperature was normal or subnormal. Animals which lived for a longer period showed a profuse watery diarrhea frequently streaked with blood. Additional symptoms consisted of dyspnea, catarrhal nasal discharge, salivation, reddening and cracking of the skin of the muzzle and progressive emaciation.

Several animals which were not examined for almost 24 hours after death showed but little tendency towards putrefaction. Similar postmortem lesions were observed in all animals. The heart was extremely flabby and in some instances apparently enlarged. Small scattered areas of congestion were observed in the lungs. The kidneys, spleen, liver, and intestines showed passive congestion. The gall bladder was greatly distended and contained thick, extremely viscous bile. Considerable ascites occurred in two animals. Fibrinous inflammation was observed on the serous surfaces of the visceral organs of four animals. Marked hemorrhagic inflammation had occurred in the mucous membrane of the abomasum and extended three to six feet into the duodenum. The remainder of the small intestine showed only slight hemorrhagic inflammation. Marked hemorrhagic inflammation was observed in the area of the ileo-caecal valve and in the fore part of the large intestines.

In a thorough examination made of the pasture, it was found that the animals had eaten the foliage from a group of castor bean plants to which cattle have had access

for many years. It is known that the castor bean plant *Ricinus communis* L. contains the toxic principle, ricin.¹ It was found also that the cattle had eaten the foliage from the branches of the tung oil tree, *Aleurites fordii*, which had been discarded in the pasture a week previously. It is known that the nuts of the tung tree contain a toxic principle, yet unidentified, which makes the meal from the pressed tung nuts nonusable as a livestock feed.^{2, 3} However, there has been no indication that the leaves of the tung tree contain a toxic principle. The following experiments were conducted on these two possible sources of toxic material:

Five pounds of castor bean leaves, stems, seeds and partly ripened seeds were macerated and force-fed to a 500-pound grade heifer. The proportion of leaves, stems and seed was such as had been consumed by the animals under natural conditions. On the second and third day following administration of this material, a mild purgative effect was noted. The animal was observed for a period of six weeks after dosing during which time symptoms previously described were not observed.

Three animals were fed leaves of the tung tree. A 300-pound Hereford heifer was force-fed 1.25 pounds of macerated tung leaves collected from the material which had been discarded in the pasture in which deaths had occurred. Hemorrhagic diarrhea developed the third day following administration of the tung leaves. Symptoms similar to those previously described as resulting in the death of 14 animals were observed. The animal was killed five days after the appearance of symptoms for pathological study.

A 500-pound grade Hereford heifer was force-fed 1.75 pounds of macerated fresh tung tree leaves. Hemorrhagic diarrhea occurred the fifth day after administration of the tung leaves. Symptoms were similar to those previously described. Seven days later the animal was in a comatose condition and was slaughtered for pathological study.

¹Muenschner, Walter C. Poisonous Plants of the United States. The MacMillan Co., New York. 1939. p. 143.

²Newell, Wilmon. Preliminary report on experiments with the tung oil tree in Florida. Bul. 171. Fla. Agr. Exp. Sta. 1924.

³Godden, W. The feeding value of tung-seed meal. Reprint Bul. Imperial Institute. xxxi (1933), 3.

Bundles of tung tree foliage were scattered promiscuously from a wagon in a pasture containing 20 well-fed, native, adult, beef cattle. All of the animals showed such a persistent interest in eating the foliage that an attendant found difficulty in driving them away before they had consumed harmful quantities. It was necessary to remove the bundles of foliage. In one cow allowed to consume all she would eat, definite symptoms of poisoning occurred five days later. The symptoms, similar to those previously described, increased in intensity until death occurred 20 days after exposure.

The three experimental animals exposed to the foliage of the tung tree showed similar macroscopic lesions. These lesions were so similar to those which resulted in natural cases of poisoning that they will not be repeated.

Histopathological studies were made of the tissues of two of the original animals and all three of the experimental animals exposed to tung tree leaves. In all instances, the microscopic pathology was similar. Marked congestion appeared in the lungs, liver, spleen, kidneys and intestines. Granular degeneration occurred in all cells of the liver, kidney, surface and glandular epithelium of the intestines and abomasum as well as in the smooth muscle of the spleen and intestines. Small scattered foci of necrosis were observed in the alveolar walls of the lungs, the tubular epithelium of the kidneys, the parenchymatous cells of the liver and the smooth muscle, villi, and submucosa of the intestine. The muscle of the heart showed well advanced cloudy swelling.

Economic management of tung groves requires that the soil be utilized to provide income during the period when the trees are coming into production. The operation of a system of soil usage which will not deplete the fertility has resulted in many instances in the joint utilization of the land as a tung grove and beef-cattle pasture. Under these circumstances cattle have not been observed to eat the foliage of the tung tree, but grazed on the native grasses or the cover crops present in the grove. Grazing cattle in tung groves has become such a common practice in Florida during the past seven or eight years, with no apparent bad results, that it is extremely doubtful that animals eat the foliage of the standing trees. As a general rule, grasses in

such groves are plentiful. On the other hand, it is usually the habit of cattle to eat or at least sample strange materials placed before them even though the animals may be well fed. That the original animals ate enough of the foliage to produce poisoning attests to the fact that the foliage of the tung tree is not obnoxious to them.

SUMMARY

Fourteen well-fed purebred Hereford and Aberdeen-Angus cattle from a herd of 44 head died as a result of eating the foliage from branches of the tung oil tree, *Aleurites fordii*, which had been discarded in their pasture.

Two heifers force-fed macerated tung leaves (1.25 and 1.75 lb. respectively) and one cow which voluntarily ate picked foliage developed symptoms of poisoning.

The outstanding symptoms of poisoning by tung tree leaves in cattle consisted of hemorrhagic diarrhea which usually became more or less watery, loss of appetite, listlessness, unthriftiness and emaciation. Symptoms occurred three to five days after exposure and one animal lingered three weeks before dying.

The most pronounced postmortem lesions were hemorrhagic gastroenteritis and passive congestion of the visceral organs.

Granular degeneration with small scattered areas of necrosis were predominant in the tissues of the visceral organs, particularly of the liver, kidneys and intestines.

Pruritus of the Tail

H. T. Clarno, Bloomington, Ill. writes: "I have a saddle mare that rubs the base of her tail all of the time and to the extent that the hair is rubbed off. Nothing seems to help. Have you any suggestions?"

It has always been conventional to blame chronic rubbing of the tail to anal pruritus due perhaps to pinworm larvae, although proof of that belief is lacking. Like pruritus of the vulva and anus of the human being, the cause may be said to remain unknown. Believing that pinworms were responsible, it was the custom of some of the older-school veterinarians to admin-

ister an anthelmintic treatment of which oil of turpentine was the choice. Three ounces of oil of turpentine, U. S. P. in a pint of linseed oil and followed up with an ounce every third day for a couple of weeks was once a venerated treatment. Rectal injections of quassia infusion was also used as additional treatment.

We have relieved the itching for a limited time by painting the anal skin down to the mucous membrane and all around the anal projection, and also the butt of the tail, once every three days with tincture of iodine.

Control of Swine Erysipelas*

There being no characteristic lesions found *post mortem*, swine erysipelas is not easy to diagnose. Lesioned heart valves and evidence of endocarditis may be caused by certain streptococci (Kernkamp). The spleen, usually, is normal and the other splanchnic organs show little morbidity, if any, because the microbial flora has localized elsewhere (joints, skin, tail). Positive proof is obtained in the laboratory by isolating the specific organism. The unopened heart, spleen and kidney taken fresh from an acute case are the preferable specimens to examine, or long bones when the carcass is putrified. Such specimens, however, are useless in cases of long standing. Moreover, the isolation of the organism is not always proof that erysipelas is the cause of mortality in a herd. It is only proof that the organism is present on the farm. The deaths may be from cholera. Erysipelas and cholera may coexist. There is no approved drug treatment. Serum-alone is known to be successful but as a preventive the immunity produced is passive and is liable to be so transient that repeated injections may have to be given to the same herd. Serum is, therefore, of more therapeutic than prophylactic value.

The culture-serum method of immunizing

*Abstracts from a paper entitled "The Diagnosis and Control of Swine Erysipelas" by J. E. Peterman, D.V.M., United States Bureau of Animal Industry, Lincoln, Nebr. Presented before the Minnesota Veterinary Medical Association, January, 1942, and published in *The Norden News*, xvi (May-June, 1942), pp. 5 and 6.

healthy herds on farms where the infection is known to exist has been on trial in Nebraska, the state and federal bureaus of animal industry, the state university and the local veterinarians coöperating. Two methods have been used. (1) single serum-culture method and (2) the injection of a double dose of virulent culture 14 days after receiving the first treatment. The relative merit of the two methods has not been assessed. In general, however, the results were quite satisfactory in approximately 700,000 hogs so treated—95 per cent exposed to undetermined degrees of infection were protected. As to the remaining 5 per cent, some of the treated hogs, healthy before being vaccinated, lost their immunity and came down with the disease. In some of the infected herds, the damage proved to be beyond repair.

The duration of the immunity acquired by serum-culture vaccination has not been determined. It appears to range from 3 to 6 months. Although hogs of all ages can be vaccinated successfully, where the disease exists in severe form, pigs should be vaccinated at the age of 1 to 3 days. Though the results obtained thus far are promising, the method is still experimental. Owing to the tendency of the infection to lie dormant for a season or two, more time will have to elapse before precise results can be computed.

The fact that the vaccine is a living product capable of transmitting infection to man must be borne in mind. A number of veterinarians have been infected in the line of duty.

Surgical Gut

To be apropos, discard the word "cat-gut." In U. S. P. XII, this type of suture material is named "surgical gut." As every surgeon knows, the absorbable suture of the surgery is made, not from cat's gut, but from the intestine of sheep. Moreover, according to a series of articles running in *Archives of Surgery*, the Department of Surgery, University of Chicago, has shown that such terms as "plain," "ten-day," "twenty-day," "forty-day" gut

are names which critical tests do not justify. The designation A, B, C, and D are to replace them in the proper terminology of the future. Trials on animals (dogs) demonstrated that while "plain" retained its tensile strength quite uniformly for five days, the chromic types were not that reliable. "Twenty" to "forty-day" material of standard brands absorbed in from less than ten days to three months or more.

Three types are proposed in lieu of the four types recognized by the Pharmacopoeia, the gradation to be based, not upon the time of absorption which is notoriously varied, but upon the actual time the tensile strength is maintained.

Thiamin Hydrochloride

From the clinical standpoint in veterinary medicine, thiamin ranks first among the vitamin B fractions: thiamin (B_1), riboflavin (B_2), pantothenic acid (B_3), niacin and niacin amide (B_5), pyridoxin (B_6), inositol, and para-amino-benzoic acid.

Thiamin is the outgrowth of the study of beriberi by Eijkman in the Dutch East Indies who, in 1897, started the historic hunt for the ingredients of food now named vitamins. Dr. Eijkman was not then a nutritionist. In searching for an infectious cause of beriberi he accidentally discovered that the feeding of unpolished rice to chickens cured them of the experimentally produced disease. The accident made a famous nutritionist out of a capable public health official.

In 1911, C. Funk (*Journal of State Medicine*, 1912) extracted crystalline vitamin B from rice polishings and in 1937, Williams split out vitamin B_1 (thiamin) from Funk's extract. Thus, from Eijkman to Williams was 40 years, showing that science, like the mills of the gods, grinds slowly.

Thiamin deficiency is expressed by poor appetite, stomatitis, blacktongue, gastric anacidity, gastric ulcers (man) and susceptibility to gastroenteritis, atrophy of the gonads, aspermia, nervous irritability (hysteria), neuromuscular disorder (polyneuritis), paralysis (Chastex paralysis of foxes), muscle soreness, myasthenia, beri-

beri and pellagra (man). In blacktongue, Chastex paralysis, and certain forms of hysteria, the cures from the administration of thiamin hydrochloride are dramatic.

An indication not to be overlooked in veterinary medicine is the thiamin deficiency due, not to its deficiency in the feed, but to the arrested utilization of the thiamin contained in the feed.

Fortunately, the range of safety in dosage is a wide one. The lethal dose for dogs has been set at 350 mg. per kg. of body weight, intravenously, and 6 to 40 times that amount by the mouth. Hecht and Weese (Germany, 1937) gave 500 mg. to normal persons daily for a month without injury. So, whatever dose is written on labels it is safe to give from 10 to 20 times that amount.

Gramicidin and Tyrothricin

The difference between these two products, commonly used synonymously, requires explanation. They are not precisely alike from the therapeutic point of view, nor chemically—the one is but a part of the other. In short, tyrothricin is gramicidin plus tyrocidine. The precipitate obtained by acidulating peptone cultures of *Bacillus brevis*, crystallizes into these two ingredients—gramicidin from acetone and tyrocidine from alcohol and hydrochloric acid. Both are polypeptides, rich in amino acids but despite their common origin they vary in their biological activity—their pharmacodynamics.

While gramicidin has marked germicide action against gram-positive bacilli only, tyrocidine is effective against gram-negative species also and is moderately effective against certain cocci. Acid-fast bacilli are exceptions. Gramicidin is essentially bacteriostatic while tyrocidine is bacteriolytic for many species.

According to Dubos and Hotchkiss* their use in veterinary medicine, internally, would be limited by toxic reactions. Gramicidin lyses red blood cells of mammals and its germicide properties *in vivo* are reduced for various biologic reasons. Intravenously,

*Transactions and Studies of the College of Physicians of Philadelphia, x (Apr. 1942), pp. 11-19.

it is extremely toxic for dogs and mice. On the other hand, tyrothricin or gramicidin alone are harmless on wounds and mucous membranes, where they exert their powerful gramcidic action in extremely weak dilutions.

Sulfaguanidine in Swine Enteritis

Studies of sulfaguanidine in the treatment of so-called necrotic enteritis of swine indicate that considerable benefit to the sick hog is derived from its use, but inasmuch as hogs with a damaged intestinal tract can not be fed out economically, preventive measures must always govern in the control of that hoglot plague. While acidulating or alkalinizing the intestinal tract, now widely employed, needs no recommendation to the practitioners of the Cornbelt, it has been its use in prevention and early stages of outbreaks that brought this type of medication into the foreground. In short, sulfaguanidine, like all drugs aimed at the mere killing of bacteria, is subordinate to hygiene and sanitation, perhaps in no small measure to the intake of vitamins A and B and, of course, to cleanliness which is often notoriously absent in swine production.

Clinical Expressions of Avitaminosis A

In cattle, besides the known ocular catastrophes, the subcutaneous edema of the limbs and the myasthenia characteristic of vitamin-A deficiency, stillbirths, weak calves and retained afterbirths are to be named among its outward expressions. In hogs, one thinks of this deficiency in cases of premature farrowing, prenatal deaths and aberrations of estrum. In general, the same syndrome applies to sheep.

Summed up from large scale observations and controlled experimental work, there is no doubt that avitaminosis A is a morbid entity with which the practitioner must reckon and keep constantly in mind, for, in addition to these diagnostic syndromes, the prodromal phenomena of these grave hazards of animal production are not as easily identified. Knowledge of the behavior of carotene in foodstuffs is impera-

tive in veterinary practice nowadays, since therein lie the clews to states of subnormal health which precede a tremendous toll from American livestock.

To Disinfect Baby-Chick Boxes

Owing to a shortage of the cardboard boxes used in shipping baby chicks, these boxes are being returned to the hatcheries for repeated use. The hazard is great because the boxes are frequently contaminated by adult poultry or the chicks themselves. Although there is no disinfection that will make the practice entirely safe, carefully painting the insides of the boxes with water glass (sodium silicate solution) will reduce the danger of infection. The box should first be scraped with a wire brush or steel wool to remove foreign material; next the inside is painted with equal parts of water glass and water; and lastly, the box is allowed to dry for at least a day before using. This treatment does not weaken the boxes nor affect the feet of the chicks shipped in them.—*Ernest C. McCulloch and Steward A. Fuller, Washington State College.*

Phenothiazine as an Anthelmintic in Sheep

In a controlled experiment conducted at the North Florida Experiment Station, the use of phenothiazine reduced the death losses caused by worm parasites from 15.87 per cent in 1939-1940 to 1.54 per cent in 1940-1941. The dose for adult sheep was 25 Gm. mixed in 250 Gm. (0.5 lb.) of concentrate, given after fasting 24 hours.

The treated animals were unthrifty and the mortality was high when the experiment was started. Copper and nicotine sulfates given on numerous occasions had failed to control the parasites. Parasites can be controlled in sheep by giving phenothiazine at monthly intervals in feed. [Swanson, L. E.: *Phenothiazine as an Anthelmintic for Sheep (an abstract)*, *Journal of Animal Science*, i (Feb. 1942), p. 62.]

EDITORIAL

Interesting Facts About AVMA Meetings

IT WOULD BE logical to ask why the 1942 meeting to be held in Chicago Aug. 24-27, is called the Seventy-Ninth Annual Meeting, inasmuch as there was no annual meeting in 1874 nor in 1914. The meeting of 1863 was a convention and the one of 1893 was a congress in the strict meaning of these terms. It is, however, rational to contend that a convention or a congress is a meeting, *sui generis*. Obviously, the seriation by calendar years came about by ignoring the two years to avoid confusion. By leaving out "annual" and counting the semiannuals held from 1863 to 1890, one could name the coming Chicago meeting the one-hundred-and-second. There were 25 semiannual meetings held: 18 in Boston, 4 in New York City, 2 in Philadelphia and 1 in Baltimore, all stated, organized sessions. The true record of the Association's meetings are as follows: 1 convention, 1 congress, 74 annual sessions, and 25 semiannual sessions—total 101. Of the total, 59 were held under the name of the United States Veterinary Medical Association and 42 after the name was changed in 1898.

The meeting of 1889, when the invitation was extended to come to Chicago for the meeting of 1890, marks a new era in the development of veterinary medicine in this country. It was a gesture to expand and nationalize by coming to the center of animal production, notwithstanding that the center of veterinary population was still in the East. The coming to Chicago in 1890 broke down for all time the criticism that the USVMA was but a provincial society. Coming to Cincinnati in 1884 had already done that to a lesser extent. The distribution of the meetings since 1890, or 52 years ago, tells the story of how the As-

sociation began to extend its influence to every nook, to wit:

Geographic Distribution of Meetings 1890-1942

REGION	CHRONOGRAM			TOTAL
Atlantic littoral	1891	1901	1918	13
	1892	1906	1927	
	1894	1908	1934	
	1899	1913	1938	
			1940	
North central including Buffalo	1896	1912	1929	9
	1900	1916	1936	
	1905	1920	1941	
Middlewest including Denver	1890	1907	1924	15
	1893	1909	1931	
	1895	1917	1933	
	1898	1921	1937	
	1904	1922	1942	
Pacific littoral	1910	1925		4
	1915	1930		
Southern states	1897	1926	1935	6
	1919	1932	1939	
Northwest	1902	1928		2
Canada	1903	1911	1923	3
Total				52

The table is intended not only to indicate that the Association has been impartial in allocating its meetings if calculated on the percentage of veterinary population, but to show the extraordinarily rapid growth of the veterinary profession in the Middlewest after the Chicago meeting of 1890.

In regard to states, a glance through the roster of meetings shows: Illinois, five meetings (1890, 1893, 1909, 1933, 1942); Missouri, five (1904, 1907, 1917, 1922, 1931); Pennsylvania, four (1894, 1908,



1918, 1927); and New York, five (1896, 1899, 1913, 1934, 1938); Ohio, three (1905, 1920, 1936); California, three (1910, 1915, 1930); Indiana, two (1912, 1941); Nebraska, two (1898, 1937) and Minnesota, two (1902, 1928).

Among the cities, Chicago leads with five meetings (including 1942). New York City and Philadelphia each have had four; Kansas City, three; and Omaha, St. Louis, Columbus, Washington, and Minneapolis, each two.

The location of meetings is now governed by a zoning system* set down in the administrative by-laws, by the solidarity and ambition of constituent associations in the four zones and, in regard to cities, upon the accommodations offered in the form of space for guests, meetings and exhibits.

A survey of the states in which meetings have been held shows that all but two of

the well-populated livestock states have entertained the Association. These are Wisconsin and Texas, both of which will no doubt have the burden of a meeting thrust upon them in the near future.

The distinction made above between convention, congress and meeting (or session) is explained in the definition of these words. The first meeting June 9, 1863, was a convention in fact. Veterinarians were summoned to a gathering for the study of the animal-disease situation of the Civil War, upon which neither the federal government nor the states had taken any concerted action. As for 1942, food supply is the motivating factor.

The meeting of 1893 should remain on the records as a congress. It was one of the many international congresses sponsored by the World's Columbian Exposition which was held in Chicago that year. Although not sponsored by the Department of State, it had the quasi-official status granted by the Exposition to other associations.

*In order to allocate the annual meetings, impartially, the United States and Canada are divided into four zones (East, Midwest, West and South) whence invitations must originate in the order stated. (*vide* cut of the four zones, herewith.)

Major George William Duncan 1887-1942

Major George W. Duncan, 55, widely known to the veterinary profession throughout the world, for his classical researches on canine distemper, with the late Sir Patrick Laidlaw, died March 21, 1942. At the time of his demise he was director of the Field Station of the Agricultural Research Council at Compton, Berkshire, England. During the World War, Major Duncan was the commanding officer of Twentieth Veterinary Hospital, B.E.F., and shortly thereafter became the superintendent of the Field Laboratories, Medical Research Council at Mill Hill, where the "Duncan-Laidlaw" canine distemper investigation was so successfully carried out, and which, incidentally established a higher mutual regard for research in veterinary science. American veterinarians join with their British colleagues in mourning the loss of a tireless worker whose name is written indelibly in the pages of veterinary history.

The AMA Session of '42 and Ours

If the prognostic adage that "coming events cast their shadow before" is a good criterion, the approaching meeting of the AVMA should not fall below the general average in any respect: attendance, interest, program, exhibits. The Atlantic City session of the American Medical Association drew a crowd of 8,238 physicians to that city in June, notwithstanding that many prospective registrants were either in the army or kept away on account of the gasoline rationing in force along the Atlantic Seaboard. The fact that the meeting hall was within the range of the enemy's guns was no deterrent to the country's physicians. They came, they planned, they worked to keep their indispensable profession in the upper level of preparedness. To them, nineteen-forty-two was a time not to stay at home but to mobilize in behalf of the country's defenses.

The example, set by the Atlantic City

session of the AMA, is one for the veterinary profession to copy, for it too has important work on its agenda. The attendance at the AVMA meeting this month will have considerable meaning. It will measure the extent of our ability to help the country in an hour of need.

The Advancement of Science*

Changing environments have greatly influenced the advancement of science. General cultural background, the printing press, the founding of scientific academies, geographic explorations, religion, superstitions, and philosophic dogmas are among the contemporaneous influences which have effected the progress of science through the periods of recorded history. The church was not antagonistic to science which conformed to its teachings, although Genesis and the belief in a geocentric universe with a heaven and a hell nearby delayed progress in geology and astronomy. These particular barriers have been broken down. Copernicus exploded the belief of a geocentric universe, geologists proved the age of the earth, Darwin started new lines of thought on evolution, and Pasteur dispelled the darkness and ignorance concerning disease. To these were added the mechanical aids (microscope, telescope, spectroscope, photography) without which science could not have advanced.

Science is a product of the human intellect which triumphed despite the imposition of obstacles (religion, superstition, prejudices, greed, ignorance). Man has made a mess of his social and economic problems owing to the still lacking brain capacity required to solve them. Such problems must be approached with an unbiased mind, unswayed by preconceived ideas and prejudices. Science discards old theories and ideas, unperturbed, when fresh facts are brought to light. It rejoices when a new step nearer the truth has been attained. Science may not be able to solve the present-day social and economic problems but they are more likely to be solved when minds

*There is a no better example of the author's theme than the present scheme to abolish scientific methods in the handling of farm-animal disease and thus place the whole structure of American food production—the basis of American civilization—in unsafe hands.—Ed.

trained in the methods of science are brought to bear upon them. It remains for the statesman, the administrator, the politician, to bring the scientific outlook to bear on the problems with which the world is faced. History provides examples of opposition to general education and of opposition of vested interests to economic reforms (e.g. abolishing slavery), yet these were broken down. Except for the hope lying in the slow ways of science, a generation which has had to live through two terrible wars (unequaled in all history), must indeed be over-optimistic to remain unperturbed over the prospect of seeing "the whole temple of man's achievements buried beneath the débris of universal ruin." The author reminds his readers that civilization

has existed for only an infinitesimal fraction of the period since man first appeared upon the earth and may perish therefrom, or suffer a grave setback. There is danger in the sociologist (politician) who deplors the intrusion of the physical or biological scientist into his field. The average man has not lost his imagination nor all of his sense of good-will toward his fellows. Scientific workers must go on working among the social problems which they have created. The stake is this civilization. Scientists have and must continue to assist evolution. Unfortunately, they are not always present when steps are authorized and taken. [Phillips, E. P.: *The Advancement of Science*, Science, cxvi (July 3, 1942), pp. 1-3.]



Committee on Local Arrangements—1942 Annual Meeting

Front Row—L. to R.—W. A. Young, L. A. Merillat, Col. J. E. Noonan, H. Preston Hoskins, General Chairman, Lt. Col. L. L. Shook, W. C. Glenney, Vice General Chairman, R. F. Vermilya. Middle Row—R. B. Gochenour, Lt. W. J. Sherwood, G. M. Smith, M. J. Thomson, J. R. Merrick, E. C. Khuen, J. G. Hardenbergh, General Secretary. Back Row—J. S. Bengston, L. L. Frederick, E. E. Sweebe, C. N. Bramer, J. V. Lacroix, Capt. R. W. Cook, V. A. Tomayko, E. M. Lynn.

Time for a Showdown*

Reports from Washington indicate that a showdown is coming between President Roosevelt, our national commander-in-chief and Mr. Earl C. Smith of 608 South Dearborn street, Chicago, the invisible figure in the congressional deadlock over grain sales and farm prices.

Mr. Smith has not figured prominently in the news. He is president of the Illinois Agricultural Association and is the real head of the American Farm Bureau Federation, of which he formerly was president. Mr. Edward O'Neal of Alabama, his successor in that post, is known in Washington as "front man" for Mr. Smith, who needed a Charlie McCarthy with a southern accent in dealing with a Democratic Congress. Mr. Smith, however, is no Edgar Bergen. He is known as "the John L. Lewis of agriculture."

In order to feed our Army and export food to our Allies, it is necessary to increase meat production in the United States. To achieve this, the government needs to sell its surplus stocks of feed grains (bought up to aid the farmers) at prices that will encourage livestock feeding. To prevent rising food prices from starting a disastrous inflation spiral, it is necessary to hold farm products in general to the very liberal level known as "parity."

The Smith-O'Neal group has blocked both of these efforts. It has gained control of enough votes in Congress to forbid feed sales below "parity," thus frustrating the meat-raising campaign needed for victory in the war. It has induced Congress to forbid farm-price ceilings below 110 per cent of parity, thus opening the way to inflation because "parity" itself rises with each advance in prices.

We might as well face the issue at once. We can't defeat our enemies overseas if we defeat ourselves at home.

The Messrs. Smith and O'Neal claim to speak for the farmers of Illinois and a dozen other states of the Middlewest and South. They actually do speak on most issues for the incorporated owners of huge mechanized grain farms and big cotton

plantations, and they extend their influence outward and downward to an uncertain extent, partly by past work in support of New Deal agricultural policies. They do not speak for the small farmers of Illinois. They are open enemies of the millions of struggling tenant farmers, sharecroppers and mortgage-ridden marginal farmers throughout the nation, whom the Roosevelt administration is trying to aid through the Farm Security Administration.

How can Mr. Smith say that he speaks for the farmers of Illinois or any other state, when he asks, in their names, that Congress pursue a policy which handicaps the nation in the prosecution of the war? We do not believe that the patriotic farmers who are sending hundreds of thousands of their boys into the Army and Navy are going to turn into chiselers and profiteers when it comes to raising food for those boys. Furthermore, the average farmer has no illusion that he can come through inflation with profit to himself while the rest of the nation tumbles into disaster.

The trouble with men like the Messrs. Smith and O'Neal is that they are not farmers, but professional political lobbyists, and lobbyists work on one universal principle—that all men are selfish and the way to get ahead is to appeal to their selfishness.

Maybe so, under some circumstances, but not when our country has been attacked by Germany and Japan and is fighting for its life. So go to it, Mr. President. Step up to Mr. Earl Smith of 608 South Dearborn street, Chicago, and tell him who is commander-in-chief in this war.

Doing One's Duty Not a Play of Words

The awfulness of conditions thrust upon the world's population, both white and dark, must be overcome by "unity of effort" if the civilization free men enjoy is to continue for the coming generations. As champions of truth, fair play and the four freedoms, the American people are fighting for their rights, if not also for the actual existence of their free, democratic

*Reprint from the Chicago Sun, July 10, 1942.

government. They are fighting against odds—odds brought about by their misplaced faith in mankind. Out of the two billion inhabitants of the earth, most of whom are in military mood, our 131 millions are a tremendous power. But, like our small profession, numbers are in inverse ratio to the grand total. Wise minds, aware of the country's position, plead for "unity of effort"—the only kind of effort that can win a war of annihilation against numerical odds.

The AVMA and its constituent associations are, therefore, striving every day in every way to aid in the war effort, frankly, earnestly, practically, by bringing as much "unity of effort" into the ranks of the veterinary profession as is humanly possible. The wartime strength of the learned professions lies in the membership of their societies. In a small profession like ours, in view of the nature of its task, membership should be practically unanimous.

Doctor Eichhorn Addresses Inter-American Conference

That the standardization of biological products through international agreement would greatly enhance disease control in the cooperating countries was the theme of an address by Adolph Eichhorn, director of the Animal Disease Research Station, U. S. Bureau of Animal Industry, delivered before the Second Inter-American Conference of Agriculture held in Mexico City, July 16, 1942. Dr. Eichhorn stressed the importance of animal diseases (tuberculosis, rabies, anthrax) which are transmissible from animal to man and of producing vaccines and other biological products of international standards and purity. Health as a foundation requirement in the production of livestock was emphasized, particularly during the present war when the need of controlling animal disease prevents interference with food-production programs and helps to increase the supply of breeding animals for restocking countries that have been pillaged. Effective veterinary planning, he pointed out, must be based upon adequate

knowledge of diseases, their cause and nature. In countries free from certain diseases, efforts should be made to guard against their introduction. The mutual advantage of free exchange of information about livestock plagues and means of com-



Adolph Eichhorn, director of the Animal Disease Research Station, U. S. Bureau of Animal Industry, Beltsville, Md.

batting them is incontrovertible and the United States is prepared to make such information available to foreign officials and stockmen and the results of their researches and experiences are welcome, the Doctor stated.

Buy War Bonds for Victory



They'll Help Win the War

There are 12 million horses and mules* of working age in this country marking time and ready to step in when the band sounds off. All there's to do is to train a generation of young Americans how to use them in the coming steel-, rubber-, fuel-saving program. Holding the lines comes natural and intuition tells which to pull on for gee, haw and whoa. One soon learns the difference between the singletree and the snaffle bit. Martingales, tugs, hames, curb chains, bridoons, crupper, breechings and holdbacks are no harder to learn than



clock back to the horse and buggy age is the atavistic phenomena which can turn an American Ghetto into a cohort of galloping horsemen in a jiffy. Horses and mules have sense, and that helps.

clutch, timer, spark-plug, and carburetor. The main differences are biological. H & M are alive. Just pouring fuel in the tank and stepping on the starter won't do. There's feeding and watering and bedding and shoeing and grooming and disposition to attend to. But the happy thing about setting

*From BAE—Ext. Flier—6, USDA, June, 1942.



Self-explanatory map showing the horse and mule population of the United States. Compiled by the U. S. Bureau of Census

CURRENT LITERATURE

ABSTRACTS

Tyrothricin* in Bovine Streptococcic Mastitis

Twenty-four quarters affected with mastitis, and treated with injections of tyrothricin are described as to severity, flora and the results obtained. *Streptococcus agalactiae* was the reigning organism. The emulsion injected was prepared according to the formula of Little: 2 to 4 cc. of 95 per cent alcohol, 20 to 160 mg. of tyrothricin and 15 cc. of sterile, double-distilled water, mixed with 25 cc. of heavy mineral oil. A uniform dose of 43 cc. was injected into the affected quarters with a 50 cc. syringe, and left in for about 12 hours. Quoting from the author's conclusions: "Evidence is presented which indicates gramicidin (tyrothricin) to be an effective chemotherapeutic agent in the treatment of bovine mastitis caused by *Str. agalactiae*. Of 20 cows treated . . . 15 were returned to usefulness." [Tripp, Lynn H., D.V.M.: *Clinical Observations on the Use of Gramicidin in the Treatment of Bovine Mastitis*, *Cornell Veterinarian*, xxxii (Jan., 1942), pp. 90-95.]

Mastitis and the Plate Count of Milk

The dairy farmer has been made aware of the economic side of mastitis. Rapid elimination of affected cows, either by rigid segregation or disposal, is generally too expensive, and gradual replacement along with segregation leaves doubt as to whether the segregated infected cows may be the cause of high bacterial counts in herd milk. Information to that effect is limited, mainly because practical methods of differentiating *Streptococcus agalactiae* from other streptococci are lacking. Experiments were, therefore, made to determine by the plate method to what extent the bacterial count of herd milk is affected by the presence of *Str. agalactiae* infection in the herd. Ninety-three herds, known to be harboring that infection, were investigated, using the old standard medium and the new standard medium of the American Public Health Association, and Edwards' medium. The results showed that the contribution of *Str. agalactiae* to the total count was but 3.10 per cent, and that while it may be responsible for a large proportion of the bacteria of low count milk, it usually con-

tributed but a small percentage of the total number in high count milk.

The total counts from the old medium (A.P.H.A.) ranged from 1,200 to 4,547,000 per cc., average 143,334, and the counts from the new medium (A.P.H.A.) ranged from 1,270 to 4,330,000 per cc., average 158,102. In Edwards' medium 78 out of the 93 samples, β hemolytic *Str. agalactiae* ranged from 7 to 217,000 per cc. In 15 samples, for the latter medium, no bacteria were present in three 0.1 cc. portions. The counts were obtained from the same samples of milk. The 93 herds were known to have had cows affected with *Str. agalactiae* infection at some time prior to the authors' study of their milk. [Morgan, Max E., Anderson, E. O., and Plastring, W. N.: *Mastitis and the Plate Count of Milk*, *Journal of Milk Technology*, v (March-April, 1942), pp. 67-76.]

Loss of Meat Poundage from Disease

In an informal observation carried out in an abattoir in Georgia, impressive losses in the form of condemned meat were noted, particularly from the kidney worm of hogs—the *Staphanurus dendatus*. The toll was in liver, kidney and muscle which "went down the chute" condemned as inedible. Winning the war would be made easier were such losses prevented. Out of 52,534 animals inspected, the loss was 92,254 lb. of liver; 17,243 lb. of kidney; and 23,640 lb. of fat, amounting in value to \$14,139.15. Inasmuch as these figures are for only one month in but a small section of the South, the total for the whole country may be imagined. The U. S. Bureau of Animal Industry has developed a system of sanitation which farmers are advised to follow. To encourage the use of the system is one of the responsibilities of the local veterinarians. The measures aim at the destruction of the larvae—the vulnerable stage of the parasite's life cycle. Feeding the adult on bare ground where the larvae will be exposed to the killing action of the sun, and providing creeps for the pigs leading to self-feeders located on adjacent, larvae-free ground, greatly reduces the incidence of kidney-worm infection. [Christain, Don, *Kansas State College: Why This Loss?*, *Veterinary Medicine*, xxvii (June, 1942), pp. 256-257.]

*Gramicidin is said to be a purified fraction of tyrothricin.

Science and Industry Turns to the Farmer

Not only will the farmer of the future grow food, feed and fiber but he will grow paint, plastics, starches, oils, enamel, newsprint, cigarette paper, glue, buttons, ink, sizing film, varnish, alcohol, insulating board, fabrics, threads, dresses, suits, and hats. Moreover, corncobs, cornstalks, straw, stumps, cottonseed hulls and even weeds are now passed to the factories from their laboratories, thanks to the support of the National Farm Chemurgic Council, the National Grange, Henry Ford, du Ponts, and other big industrialists. The making of auto bodies from soybeans and straw, building material from sawdust, hats from skimmed milk, clothes from grass, paper from cornstalks, yeast from wood paste, starch from potatoes, airplane bodies from plywood, varnish from corn, and flavors from wood pulp, are some of the newer products of farming, indicating what science is doing for agriculture and what farming is doing for industry. The transfer of the manufacture of cigarette-paper from France to North Carolina gives that state a \$4,000,000 plant, and an opportunity to utilize 100,000 acres for raising the flax that will be needed to furnish the basal material. From the field of dairying, chemistry is transforming milk into fabrics, plastics, glue, paper sizing, wine, vinegar, milk sugar, alcohol, lactic acid, textile fiber, insecticides, electrolyte baths, glycerin substitute, and tannin compounds. In fact, the list of utilitarian products now made from the by-products of the farm is endless—too long to enter here. Many of these new uses of farm products were brought about through blocked importation of war necessities, which should be the starting point of a new era for American agriculture.—*From Pathfinder, May 22, 1942.*

Equine Encephalomyelitis in Man and St. Louis Encephalitis

Because tests for neutralizing bodies is an aid in differentiating neurotropic virus diseases, the equine type of encephalitis has become a recognized entity in man. Physicians are able to separate the mild case of encephalitis from the nonparalytic cases of poliomyelitis. Formerly, many cases of infantile paralysis, though actually human cases of equine encephalomyelitis, were not diagnosed as such. Out of 498 human serum specimens from cases of neurotropic virus diseases (human), including poliomyelitis, 213 (42.3%) neutralized the virus of western equine encephalomyelitis, 55 (11.5%) out of 475 samples neutralized only the St. Louis strain, and 62 (13%) neutralized both. During the three years of the study, 140 tests were positive only for western equine virus and 55 for St. Louis virus only. The western virus was recovered from three human brains and the St. Louis virus from three other human brains. The serums of 32 encephalitis

cases were all negative to the eastern strain of equine virus. [Howitt, Beatrice F.: *Human Equine Encephalomyelitis and St. Louis Encephalitis in California, 1939-41. American Journal of Public Health, xxxiv (May, 1942), pp. 503-515.*]

Paratyphoid Infection in Poultry

This enzoötic occurred in a flock consisting of 19 geese, 50 goslings, 8 turkeys, 21 poults, 18 chickens and 40 chicks. Within three weeks, all the young birds except a few chicks died. The outstanding symptom was diarrhea. None of the old birds was visibly affected, but blood specimens from them showed that about half of the adults in each species had specific agglutinins.

The birds were destroyed and many showed lesions in the liver or ovary. *Salmonella typhi-murium* was isolated from nine geese of which only two had specific agglutinins. It was recovered from five turkeys, all of which were serologically positive, and from eleven chickens of which only two showed a positive agglutination test. The microorganism was isolated from eight turkey eggs and seven goose eggs. It is thought that the disease was contracted from a refuse heap containing putrid meat and mink carcasses from a nearby mink farm. It was spread to the young birds through the eggs in the incubator or by direct contact with those diseased. The enzoötic could be traced to at least four farms by the sale of young birds or eggs for hatching. Three people on the farm where the disease first occurred developed symptoms of paratyphoid infection two weeks after the outbreak started. Serums from these persons contained specific agglutinins and *S. typhi-murium* was recovered from their feces.—A. G. K. [Hedström, Harry. *En paratyfusenzooti, orsakad av Salmonella typhi murium, hos fjäderfä med överföring till människan (An Enzoötic of Paratyphoid Infection Caused by Salmonella Typhi-murium in Poultry with Transmission to man.) Skand. Vet.-Tidsk. xxi (1941), pp. 98-118; English summary pp. 114-116.*]

Intracervical Survival of Spermatozoa

The motility of spermatozoa was formerly regarded as the main factor in fertility but about 20 years ago Hubner introduced postcoital, intracervical examinations to determine the compatibility between the male and female secretions, thus to establish the presence of incompatibility comparable to that of blood groups. The extent to which the findings indicated defective spermatzoa or some disturbance in the female was not, however, made clear. Investigations carried out on animals in the 1920's revealed a relationship between structurally abnormal spermatozoa and reproductive ability. While these studies in

animals showed that no other tests provided information of equal value in that respect, similar ones in man are sparse. The idea that motility alone was a satisfactory criterion, thereby became untenable. To be clinically useful, motility tests of spermatozoa must indicate to some extent their reproductive power. It was, therefore, to determine the clinical significance of motility that the authors made postcoital examinations on a group of sterile matings [human], past observation having shown but little connection between the seminal picture and the ability of women to conceive. When two normal persons mate, live spermatozoa should be found in the cervical canal at some period after coitus since the stronger ones should be able to migrate toward their normal destination. However, if the examination is made too early it may not determine sperm survival within its physiologic usefulness. The opportune moment to make such examinations appears to be between 2 and 15 hours after coitus; after 48 to 72 hours, examination is hardly worth the attempt. Lack of mobility or absence of spermatozoa in the cervical canal after normal mating are presumed to be due to some alteration in the secretion of one or the other sex: somatic or organic disorder impairing the health of the gonadal tissue of the male, local disorder in the genital tract of the female, or some chemical introduced. When these factors are considered, negative findings are better understood. The tests were made with respect to their relation to different periods of the menstrual cycle and the character of the female mucus during the given period. The conclusion, briefly told, was that a variety of factors influence intracervical survival of spermatozoa and that the effects of the cervix on them is neither uniform nor pronounced enough to incriminate any one etiologic factor. [Williams, Walter W., D.V.M. M.D., and Sommons, M.D.: *The Intracerebral Survival of Spermatozoa*. *American Journal of Obstetrics and Gynecology*, xliii (April, 1942), pp. 652-662.]

Friendly Microbe in Beer

Drs. O. S. Fowler and Paul C. Carson of Denver reported to the Southwestern Division of the American Association for the Advancement of Science that beer contains a microbe that is deadly to harmful germs found in various parts of the body. The name given to it is the *Bacillus alkaligenes*, which was discovered in Russia in 1915. It is said to alkalinize living tissue. In the mouth, as the story goes, it counteracts the acid-forming bacteria that cause dental decay. Among its other properties are the prevention of colds, toothache, sinus trouble and the relief of asthma and surgical sepsis. [The Union Server, xx (May 11, 1942), p. 1.]

Blood Protozoan of Turkeys Transmitted by Flies

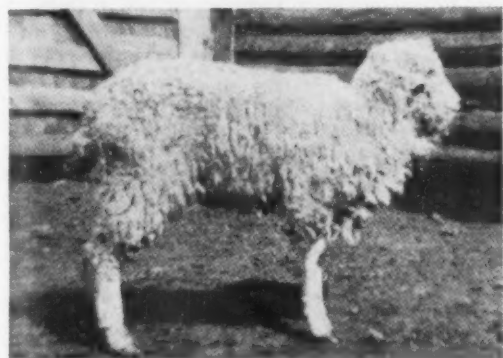
In histopathologic studies of tissues from 21 turkeys infected with *Leucocytozoon smithi* and killed 24 hours to 12 days after the injections, no schizogonous stages of this protozoon were found. From continued observations it is concluded that the gametocytes of this protozoon, observed in the blood of affected turkeys, occur in the plasma and not in any host cell. In a further study of turkeys, infected with this parasite, in which numerous gametocytes could be demonstrated in the peripheral blood for several months, gametocytes did not recur in their blood, when kept screened away from flies for a year, while in control turkeys exposed to flies, gametocytes did recur, indicating that a sexual reproduction of the parasite did not take place in the turkey. The oöcyst stage occurs in the stomach wall of *Simulium nigroparvum* and not on the wall as do malaria organisms in the mosquito. From this work it appears that the life cycle of *L. smithi* as it occurs in turkeys and in *S. nigroparvum* is as follows: Macro- and micro-gametocytes are taken into the stomach of these blackflies while engorging on the blood of infected turkeys. These develop into macro- and micro-gametes, respectively, and after fertilization the resulting zygote uncoils in the stomach of the fly to become a motile oökinete which finds its way into the stomach wall where it rounds up to become an oöcyst. The oöcyst, after maturing, ruptures to release sporozoites which find their way to the lumen of the salivary glands of the fly. When these infected flies bite turkeys, the sporozoites enter the blood stream of the turkey where they develop into gametocytes in the plasma. [Johnson, E. P. (Virginia Agricultural Experiment Station, Blacksburg). *Further Observations on a Blood Protozoan of Turkeys Transmitted by Simulium nigroparvum* (Twinn), *Am. J. Vet. Res.* iii (Apr. 1942), pp. 214-218.]

Weil's Disease

The author has diagnosed 40 human and 25 dog cases in the United States since 1937 by means of agglutination tests and animal inoculations. *Leptospira* was also isolated from wild rats captured in New York City, Washington, D. C. and Detroit. Several species of American deer mice and albino deer mice were found to be very susceptible to *Leptospira icterohaemorrhagica*. In over 600 mice inoculated, the illness lasted 5 days. The latter is regarded as the ideal test animal. Importance is attached to the wide geographic distribution of the disease in man and dogs. [Packchianian, A.: *The Distribution of Weil's Disease in the United States and Methods of Diagnosis in Man, Dogs, and Rodents*. Abstract, *E. S. R.* lxxvii (July, 1942), p. 112.]

Tularemia in Sheep

The first known outbreak of tularemia in sheep was reported by Parker (R. R.) and Dade (J.) in 1929 who reported on the transmission of *Pasteurella tularensis* to sheep by the tick *Dermacentor andersoni* Stiles in Montana. McNabb (A. L.) reported the first human case in Canada in 1930, although human cases were described in the United States in 1914, or two years after 1912 when the disease was discovered in rodents by McCoy and Chapin. The disease was found recently in a flock of 850 yearling ewes in Alberta, after a classical investigation by the authors. The deaths numbered 24 head, and 5 or 6 more were seriously



—Courtesy of the Canadian Journal of Comparative Medicine

Fig. 1—Sheep sick ten days with tularemia.

ill. The number of milder infections was not determined.

The symptoms were loss of weight, weakness, rapid breathing, fever (104 to 106.4 F.), nasal discharge, fetid and dark diarrhea, grinding the teeth, stiff movements, and tick infestation. The ewe shown in the illustration had been sick 10 days and appeared to be recovering.

The autopsy (described) revealed a heavy infestation of engorged ticks and keds, edematous and hepatized lungs, dropsy of the pericardium; enlarged and pale bronchial, medias-

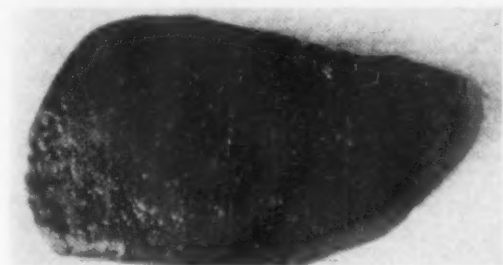
tinal and prescapular lymph nodes; white spotted serosa of the spleen; kidneys pale, liver normal and firm and gall bladder enlarged. The diagnosis was confirmed by laboratory examination in which agglutination results agreed with the guinea pig inoculations described. [Gwatkin, Ronald, Painter, R. H., and Moynihan, W., Division of Animal Pathology, Science Service, Lethbridge, Alberta: Tularemia in Sheep, Canadian Journal of Comparative Medicine and Veterinary Science, vi (June, 1942), pp. 163-168.]

Effects of Low Temperature Exposure on Worm Eggs and Larvae of Equine Strongyloidae Nematodes

The prerequisite to the survival and development of worm parasites are adequate moisture, and proper temperature. Low temperature, desiccation and direct sunlight are destructive to them. As natural destructive agencies, direct sunlight and low temperature rank highest. The author found that in so far as the eggs and larvae of the strongyloidae nematodes of horses are concerned, embryonated eggs are less resistant to low temperature exposure than unembryonated ones. Ninety-four to 100 per cent of eggs taken directly from the feces resisted a temperature of 14 to 21 F. for 47 to 56 days, while partially hatched (embryonated) eggs were more vulnerable to the same degree and time of exposure, although the exact resistance of the latter was not determined. Temperatures ranging from 14 to 21 F. appeared for 1½ to 4 days to be a limit of endurance, while exposure to 36 F. for 195 days did not completely sterilize the culture and in some experiments one-half of the eggs survived at that temperature. Eggs hatched outdoors at a temperature fluctuating above and below freezing point, representing winter and spring weather. The killing action of such fluctuations depended upon the relationship between the variables. [Luckner, John T., Associate Zoologist, Bureau of Animal Industry, U. S. Department of Agriculture. Journal of Agricultural Research, lxxiii (Aug. 1941), pp. 193-218.]

The Cattle of North America

The first importation of cattle to the Western Hemisphere came with the second voyage of Columbus (1493). Early in the 16th century (1512) considerable numbers were raised in the West Indies. In 1572, cattle raising was flourishing in New Spain (= Mexico). The number on hand was estimated at 20,000. The production of hides, tallow and work oxen was the objective. All but the tongues was "heaved to the fowl," says a report written in 1565. The cattle population of the West Indies was 60,000, and the total of all farm animals was 100,000. Through the visit of Sir Walter Raleigh to Haiti in 1585, the English colonists discovered



—Courtesy, *ibid.*

Fig. 2—The spleen of a guinea pig injected with a tick suspension.

the source of supply of farm animals for their colonies established later along the Atlantic seaboard. The French, Dutch and Swedes imported animals from their respective countries until 1640, when importation ceased because the increase in numbers exceeded the local needs. In 1701, the French settlement at Mobile, (Louisiana), stocked up with cattle, hogs and horses from San Domingo. The increase was slow for by 1724, there were but 1,400 cattle in Louisiana and in 1746 barely 10,000. Similar increases took place along the Gulf area before it became a part of the United States. In 1728, cattle were plentiful in Virginia, the Carolinas and the northern colonies, and this state of affairs continued until the Civil War—plenty of cattle of poor quality. No thought nor attempt to improve breeds, either here or in England, then existed and that fault has not entirely died out. Many of our cattle are still influenced by the blood of their colonial ancestry, though breed improvement began in a small way some 80 years ago. To be convinced, says the author, one only needs to travel through the Southwest, our oldest cattle country. [Bowling, G. A.: *The Introduction of Cattle into Colonial North America, Journal of Dairy Science*, xxv (Feb. 1942), pp. 129-152.]

Science Integrates the World

Although wars and the economic rivalries of peace isolate and split up the world into separate units, science and learning, whether we wish it or not, are definitely internationalized into a pattern of unity. The society of mankind benefits by contribution of knowledge made by every nation in the world. Our children are guarded from diphtheria by what a Japanese and German did; we are protected from smallpox by the work of an Englishman (Jenner), from rabies because of a Frenchman (Pasteur) and we are cured of pellagra through researches of an Austrian (Eijkman). An American soldier wounded on a battlefield in the Far East owes his life to the Japanese scientist (Kitasato), who isolated the bacillus of tetanus. A Russian soldier saved by a blood transfusion is indebted to Landsteiner, an Austrian. A German soldier is shielded from typhoid fever by the help of a Russian (Metchnikoff). A Dutch marine in the East Indies is protected from malaria because of the experimental work of an Italian (Grassi), while the British aviator in North Africa escapes death from wound infection because of the Frenchman (Pasteur) and the German (Koch) and the Englishman (Lenter).

What is said of medical science applies to other sciences; whether it's mathematics, chemistry, bridges, or automobiles, ideas can not hedge behind international boundaries. Science has laid the foundation of a coöperative world and the unifying process has been at work for

three hundred years. The cornerstones of society are the common interests relating to the welfare of all men everywhere. [Fosdick, Raymond D., *president Rockefeller Foundation: A Review for 1941*, quoted in *American Journal of Public Health*, xxxii (June, 1942), p. 638.]

Antimony in Human and Veterinary Medicine

The first scientific use of antimony in modern medicine began with intravenous injections of tartar emetic in 1906. Tropical diseases were the first indications recorded for compounds of the element. The pentavalent combinations were used in kala azar (leishmaniasis) and the trivalent for such infections of helminthic origin as bilharziasis, a grave, fatal, chronic disease caused by *Schistosoma haematobium*, which is now known to have affected the ancient Egyptians.

Fuadin (an antimony specialty) was named for Fuad, one of the kings of Egypt. In 1928, more than 400,000 cases of bilharziasis in Egyptian hospitals were treated with this drug. Millions of lives have since been saved by the use of antimony compounds. In animal medicine, they have been used in leishmaniasis, trypanosomiasis, filariasis and other parasitic infections. The value of fuadin in heartworm infection was established by zoölogists of the U. S. Bureau of Animal Industry (Wright and Underwood) in 1932-1934. Practitioners obtain 90.3 per cent cures among the dogs treated for heartworm (*Diofilaria immitis*) infection. A great deal of suffering in man and animals has been relieved by the use of these antimony compounds. [Fanslay, Charles E., D.V.M.: *The Universal Scope of Antimony Preparations in Human and Veterinary Medicine, Veterinary Excerpts*, ii (1942), pp. 3-6.]

Infertile Incubator Eggs for Hog Feed

Eggs failing to hatch in the incubator on account of infertility may be fed to hogs with the assurance that 89 per cent of the protein and 85 per cent of the fat are digested. In trials to determine the relative food value of raw and cooked eggs in growing pigs, the authors conclude that the pig is unique in its ability to utilize raw eggs and probably derives biotin from them. The eggs were fed with equal weight of ground corn and 0.3 per cent of salt. Digestibility for raw and cooked infertile eggs was found to be the same. The results were determined by chemical studies of two pigs (congeneric mates), weighing, respectively, 64.5 and 61 pounds. [William, J. P., McKay, C. M., Salmon, O. N., and Krider, J. L., *Cornell University: A Study of the Value of Incubated Eggs and Methods of Feeding Them to Growing and Fattening Pigs (an abstract)*, *Journal of Animal Science*, 4 (Feb., 1942), p. 72.]

Veterinarians Nutrition Conscious

The newer knowledge of nutrition is being applied to farm animals through studies conducted in veterinary medicine and related fields. Investigations made by Doyle of Purdue on pig mortality, by Killham of Michigan State on cobalt privation, and the articles on nutritional subjects written by Way, Hawthorne, Quin, Schlotthauer, Hastings, McIntosh and others for the JOURNAL, as well as the number of articles carried in leading veterinary magazines contributed by men in the field of practice, speak well for the broad training veterinarians are receiving and the interest they are taking in the physiology and pathology applicable to the study of nutrition.

A recent article by Breed on swine problems illustrates the part nutrition is playing in the prevention of animal diseases and the differentiation of entities formerly confusing to practitioners of the Cornbelt, like pig pellagra and infectious enteritis. Pig pellagra, for example, is not a new malady but an old one not hitherto differentiated. Quin points out how knowledge of aphosphorosis came into the veterinary picture in the past 20 years and its now known relationship to previously unidentified ailments. Dudley, Kansas practitioner, who recognized mineral deficiency as the cause of 20 abortions in a herd of 80 cattle and corrected the trouble by feeding bone meal, is related as another example to show that veterinarians are conscious that in animal production and in the practice of veterinary medicine the detailed knowledge of nutrition brought to light by the field of research is of paramount importance. [Editorial: *The Veterinarian and Nutritional Problems of Farm Livestock, Vitamin D Digest*, iv (Apr., 1942), pp. 13-14.]

The Origin of Cancer

While the early studies of cancer were riveted on the nature of the malignant cell as the sole etiologic problem to be solved, it has since been proved that the origin lies within the cell itself, perhaps independent of stimuli acting from without. Changes within the cell are now spoken of as the cause of cancer. But this conception accounts for only one aspect of the complex problem. Like the age incidence which is not adequately accounted for, other causes must be sought. Since cancer can be caused by a variety of agents as readily in young as in old experimental animals, the fraction of the span of life (which is two years for mice as compared with 70 years for man) must be examined in determining why the slow cancerous process is more likely to respond to carcinogenic stimuli at a certain period.

When the intracellular change has once occurred it persists after the carcinogen has been withdrawn. This is proof that the autonomous

growth of cancer cells is a property residing within the cell, a property one might call the "proximate cause" as distinguished from the "remote cause" which frequently, if not always, paves the way for the intracellular process, the precise mechanism of which remains to be explained through new disclosures in intracellular physiology. At present these two factors—remote and proximate—should be treated as two distinct problems of carcinogenesis. The former falls into two groups: chemical and physical agents. There are about 170 chemical substances identified with the cause of cancer. These the author subdivides into two groups: extraneous and endogenous. Examples of the former are tar, shale, radiation and of the latter such hormones as the estrogens, and the mother's milk factor. Physical influences are likewise numerous and these together with the carcinogenic chemicals (endo- and exo-) are complicated with heredity, the age factor, pre-cancerous conditions, susceptibility (host factor), geography, occupations, social life, etc., to such an extent as to leave the cancer problem unsolvable until the nature of the "proximate cause" has been worked out. The author suggests that cancer be studied not in terms of a "central problem" but as a separate problem for each organ in order that the origin of cancer may be tracked down to its lair. Summed up, the conclusion spells "pessimism." [Cramer, William, M.R.S.C., D.Sc., Ph.D.: *The Origin of Cancer in Man, J.A.M.A.*, cxix (May 23, 1942), pp. 309-316.]

Amyloidosis in Mink

Amyloidosis was found in 22 mink of which 14 came from the same farm. The other eight cases were from four different mink farms. The characteristic gross lesion was enlargement of the spleen, which was firm and had a yellow to light red-brown color. Microscopically it showed amyloid in the media of the smaller arteries with perifollicular deposits in extreme cases. Some cases had enlargement of the liver which was of lighter than normal color. Microscopically there was deposition of amyloid about the sinusoids and atrophy of the adjacent liver cells. A few mink had amyloid deposits in the adrenal glands, lungs, the gastrointestinal mucosa and, in one case, in the kidney. Some of the mink had suppurative lymphadenitis or subcutaneous abscesses, but most of them had no lesions to explain the presence of amyloid in the various organs. Since it appears to be restricted to certain farms, it is thought that it might be related to the diet. It is known that amyloidosis can be produced experimentally by feeding casein or cheese.—A. G. K. [Nordlund, Ingrid. *Amyloidosis hos Mink (Amyloidosis in Mink.) Skand. Vet.-Tidsk.* xxxi (1941), pp. 1-8; English summary, pp. 7-8.]

The Passage of Milk Into the Rumen and Reticulum in Calves

The theory of Schmoker that the slant of the calf's head in suckling or drinking from a pail is a factor in diverting milk from its normal course to the abomasum was proved by the authors to be a miscalculation. A study of the effect of extending the head up and down in calves examined *post mortem* immediately after stunning failed to show that the movements had any action on the opening and closing of the esophageal groove. Further studies were made through rumen fistulas of calves drinking from nipples at various heights and from open pails on the ground. This observation showed that feeder level did not influence the course of milk consumed from a nipple but that milk drunk from an open pail frequently does flow into the rumen. To these authors the reflexes of the pneumogastric governs the course milk takes in its downward flow. This finding confirms the observations of Watson on lambs in Australia. [Wise, George H., Anderson, G. W., and Miller, P. G.: *Factors Affecting the Passage of Liquids into the Rumen of the Dairy Calf. II Elevation of the Head as Milk is Consumed, Journal of Dairy Science*, xxv (June, 1942), pp. 529-536.]

Control Animal Parasites

About one-half of the losses from disease among farm animals is caused by parasites. The estimate is \$125,000,000 a year due to deaths of young animals, unthriftiness, and stunting. To this sum may be added a loss of 50 million to 100 million dollars a year from ox-warbles. Screw worms are believed to take a toll of 6 to 10 million dollars in Florida and Texas. Although America produces an abundance of food, it devolves upon husbandmen to bend every effort to increase efficiency in the food-production program. Owing to the situation in Australia, American sheep have become more important. Although they (sheep) have no disease as destructive as hog cholera, the stomach worm (*Haemonchus contortus*) takes a toll amounting to several millions annually. The use of copper sulfate and phenothiazine is discussed.

Ascarids, kidney worms, lungworms, thorny-headed worms, nodular worms, and intestinal threadworms, are costly parasites, which may be avoided by sanitary measures. Ascarids, strongyloides, and bots reduce working efficiency. Summed up these losses are significant in wartime. Controlling them is a step toward victory. [Foster, A. O., associate parasitologist and Pindler, L. A., zoölogist, U. S. Bureau of Animal Industry, *The Extension Animal Husbandman*, Serial 66, (June, 1942), pp. 2-6.]

BOOK NOTICES

A New Journal of Science

A new journal of interest to the veterinary profession is named the *Journal of Animal Science*. It will be published quarterly—February, May, August, November. The first issue appeared in February. Its sponsor is the 33-year-old American Society of Animal Production and the editorial staff is composed of specialists in genetics, nutrition, physiology, meats, wool, dairy cattle, extension work, and general livestock problems. [*Journal of Animal Science*, Menasha, Wis., \$3.00 a year in the United States and its possessions, \$3.50 in foreign countries of North and South America, and \$4.00 elsewhere. Free to members.]

War Gases

Memories of gas and gas masks will impress the survivors of World War I with the value of this book. Better not wait for practical experience to do the teaching. The havoc war gases can play on man, animal, food, water, and forage and the hellish warfare these unseen killers represent are being overlooked by our complacent population. Regardless of its deadly ways, civilian defense against poison gas is an X hazard to the American masses, notwithstanding that our enemies are capable and probably ready any day to give us a dousing of gas that will translate by example the true meaning of "unpreparedness." In this respect, our unpreparedness is total. Knowing practically nothing about either the contaminant or decontaminant, a gassed American community could do nothing but suffer the lingering agony of war gases or pass on to the dreamless slumber of eternity.

Despite the tacit agreement that poison gas will not be used in this war—obedient to the Geneva General Gas Protocol of 1925—the breaking of that pact can be expected since one of the Axis powers (Japan) has already shown her contempt for that international *entente*. Obviously, the passing of savagery from this civilization is not "in the cards." Unfortunately however, (and this may be etiologic) Americans have no right to register complaints. The League of Nations, designed to bring some degree of finesse into the war-mad world, was entirely high-hatted by our upper branch of Congress, and treaties of the Permanent Court of International Justice (The Hague, 1921) failed also to impress our political-minded Senators. Up to the present moment when the Japs are spraying the

Chinese with poison gas, ratification of these steps toward higher ideals has been defeated in the U. S. Senate, the last time as late as 1935. Inasmuch as outlawing war and certain war methods was never subscribed to by our own people, the solemn protocols about poison gas can not be invoked consistently in behalf of our unprepared population. We are too isolated to get gassed, is the obvious theory. We reserved the right to do as we please, and that's that. Owing to mass faith in that erroneous doctrine of national aloofness, relatively little was ever done to edify the American people in this and other types of weapons. Relatively little, as the author says, was ever written on the subject in the United States. Published information in the form of leaflets and articles in periodical literature, mainly of War Department origin, inconvenient as they are to obtain, lack the completeness and practicability for programs of civilian defense. A book covering the whole subject in readable form is, therefore, timely. For veterinarians in their professional capacity as guardians of food-producing and pet animals and as food inspectors, *War Gases* is indispensable. Planned protection of animals against air raids would be incomplete without knowledge of war gas.

Needless to say that for officers of the veterinary corps who, in their line of duty as food inspectors should not miss any of the scientific facts concerning war gases, nothing short of every detail will answer their purpose. *War Gases* contains those details. Their effects on livestock, pastures, forage, meat, butter, oils, milk and drinking water, clothing, and miscellaneous material and rules for condemnation or decontamination are as fascinating to read as they are important to soldier and civilian.

There are 83 war gases. After naming and describing these as to their action (lung irritant, irritant, lacrymators, toxic smokes, labyrinthic gases, vesicants, systemic poisons, smoke screens, incendiaries), there are chapters on the effect of war gases on materials, water, food and sampling; the methods of analysis, detection, tests, and decontaminants.

The appendix contains five tables: (I) Conversion Table for Gases and Vapors, giving the molecular weight; mg. 1, ppm; and *vice versa*; (II) The Physical Constants of the Chemical; (III) Warfare Agents; (IV) The 33 war gases of World War I; and (V) Military Symbols and Names for War Gases (83 of them).

War Gases is a book every veterinarian should have and should study in both professional and civilian capacity. It's shirking to dodge the knowledge this book contains. [*War Gases* by Morris B. Jacob, Ph.D., formerly of the Food and Drug Administration, USDA, Chemist, Department of Health, New York

City; formerly Lt. Col. Chemical Warfare Service Reserve. Interscience Publishers, Inc., 215 Fourth avenue, New York, N. Y. 1942. 180 pages. Cloth. Price, \$3.00.]

Treatment of War Wounds

This booklet is a treatise on the classification of war injuries and the treatment of war wounds, burns, and war-gas casualties, and gives 14 recent references on these subjects. The author forthwith reminds the reader that war wounds differ materially from those suffered in civilian life. The severity of the tissue disruption due to the high velocity of flying material and the greater severity of the shock are pointed out. Bomb particles, for example, may fly at a speed of 5,000 ft. per second, or faster than bullets from the modern rifle. The generally accepted theories of shock and its modern treatment are related.

The local surgical treatment of fresh wounds, infected wounds, gas gangrene, and their post-operative care is a reiteration of modern conceptions in regard to débridement, drainage, irrigation, and protection. For local chemotherapy, the old antiseptics are discarded, and rightly so, and replaced by the sulfonamide drugs. The use of these is treated in detail in respect to their effectiveness and safety, adjuvants, methods of use, and influence of the process of regeneration. The newer anesthetics, inhalent and parenteral, are briefly mentioned. The chapter on the therapy of burns (of little importance in animals) is a classical conception of the modern methods of treatment: immediate, coagulation, saline bath, and envelope treatments. The part on war gases is a discussion of their chemical and physical properties, the damage they inflict and the symptoms and treatment. The *lung irritants* named are phosgene, diphosgene, chlorine, chloropicrin, nitrous fumes, and ammonia. The *vesicants* described are mustard gas, lewisite, and other dichlorasines; the *lacrimators*, ethyl-iodo-acetate, brombenzyl cyanide, and chloracetophenone. The "*sneezers*" included are Adamsite diphenylaminechlorarsine and diphenylchlorarsine.

Three chemicals employed to make *smoke screens* for the concealment of ships and troops are listed and described. These are white phosphorus, titanium tetrachloride, and sulfur trioxide. One is also reminded that there are *systemic poisons* used in modern man-killing: hydrocyanic acid, hydrogen sulfide, arsine (AsH_3), and carbon monoxide. [*Treatment of War Injuries*. Merck & Company, Rahway, N. J. A multigram of 63 pages. Price not given.]

National Poultry Improvement Plan

This booklet contains the USDA revised directions for carrying out the poultry im-

provement plan which became operative July 1, 1935. It is a guide to the state agencies to whose supervision the actual control work is entrusted. In matters pertaining to disease, the work is directed under the state livestock sanitary authorities, agricultural college, or specified agency. For testing of birds for pullorum disease the testing "shall be done by a state pullorum tester or pullorum-testing agency," but only the former (state pullorum tester) is acceptable for certifying to the health of flocks to be designated as U. S. Pullorum-Passed, or U. S. Pullorum-Clean. Three agglutination tests are recognized: (1) standard tube test approved by the United States Live Stock Sanitary Association (1932); (2) stained-antigen rapid test of Schaffer, McDonald, Hall and Bunyea (1931), described in the Journal of the American Veterinary Medical Association; and (3) rapid serum test, of Runnells, Coon, Farley and Thorp, *ibid.* 1927. General directions on time of testing prior to selling eggs for hatching, incubator sanitation, and state inspections, are given. The objects of the plan are (1) to improve production and breeding, (2) to reduce mortality from pullorum disease, (3) to identify breeding stock, eggs and chicks in uniformly accepted terms, and (4) to facilitate scientific research on the improvement of poultry and poultry products. For the guidance of laboratory and field workers an appendix describes the details of pullorum-diseases testing as published in the proceedings of the USLSSA for 1932 and in the JVMA, lxxxii (1933), pp. 488-490. [Miscellaneous Publications, USDA, No. 300 (1938), revised June, 1941: The National Poultry Improvement Plan. U. S. Bureau of Animal Industry, Washington, D. C., edited by Theodore C. Byerly, senior poultry husbandmen.] Price 10c.

Analytical Chemistry of Industrial Poisons, Hazards and Solvents

While academic for all branches of medicine, this book was written for the industrial physician and hygienist, sanitary official, lawyer, toxicologist or groups working with problems created by exposure to poisons—problems as old as ancient medicine and that modern industrial life have intensified. It covers the broad field of organic and inorganic toxicology, germicides, fungicides, insecticides, fumigants, and the gases of chemical warfare, obviously without the omission of any substance known to inflict injury to man. The chapter on dangerous metals (lead, mercury, antimony, arsenic, chromium, selenium, thallium, copper), to which animals are frequently exposed in various ways, may be singled out for its applicability to the practice of veterinary medicine. The chapter on chemical warfare needs no boost as to its importance at the present time in both animals of the military service

and those of the food supply. Occasionally, in military operations, war gases contaminate food. A knowledge of them now is opportune. We are also concerned with sulfur compounds (HS and SO₂), the former for its toxic action during digestive fermentations and the latter for its use as a fumigant in mange treatment.

Hydrocyanic acid of forage, killer of many farm animals, is not treated *per se*, although the tests described for its determination should apply as well for sorghum, Sudan grass and seed cakes as for the HCN of any material.

The grouping of harmful solvents into one category is new in veterinary medicine, although it is a list of familiar agents routinely employed: petroleum, alcohols, turpentine, chloroform, acetone, tetrachlorethylene, and others. The toxicity of solvents depends upon the concentration and the manner used. These are divided into three classes: mild, medium and strong of which ethyl alcohol, tetrachlorethylene and methyl alcohol are respective examples.

If the average doctor shies at the title—graduate chemistry does that—the text of this book belies the scare. It is interesting, edifying, useful. Scientists have found the way to make themselves popular without descending from their throne. [Analytical Chemistry of Industrial Poisons, Hazards and Solvents by Morris B. Jacobs, Ph.D., Food, Drug and Insecticide Administrator, USDA (1927), chemist, Department of Health, New York City and formerly Lt. Col., Chemical Warfare Service, U. S. Reserves. Interscience Publishers, Inc., New York. 1941. Cloth. Price \$7.00.]

The Importance of Vitamin D for Cattle

This booklet deals with the importance of vitamin D in the feeding of cattle and with the influence of various preservation processes upon the content and action of vitamin D in green fodder. There is a brief review of the chemistry and the physiological effect of the antirachitic vitamin. The relationship of vitamin D to the change and the assimilation of matter, particularly the assimilation of calcium and phosphorus, is also discussed. A further chapter points out the significance of the natural vitamin D sources available to cattle.

The experimental part of the work deals with the theory of the vitamin D rôle in plant material and tests to determine the effect of various drying and ensiling processes on the vitamin D content in clover leaves. Particular attention is given to the effects produced by microorganisms on the action of the vitamin D contained in plant material. [Über die Bedeutung des Vitamin D bei der Ernährung des Rindes by Dr. Von Otto Allemann, technical and agricultural engineer. Hans Huber, Berne, Switzerland. 84 pages. 15 illustrations. Paper. Price 5.50 francs—3.30 Reichmarks.]

THE NEWS

AVMA Activities

Board of Governors Meets for Two Days

Changes in plans for the 79th annual meeting caused by the taking over of the Stevens Hotel by the Army, effective August 1, 1942, brought the Board of Governors together on July 13-14, while President Jakeman was in Chicago en route home from attending three meetings in the Northwest. Business transacted related primarily to the need for carrying on with this year's session which, all factors considered, is unusually great. The decision (see p. 83) was reached only after most thorough deliberation and consultation.

Can You Help Locate These Lost Members?

The aid of JOURNAL readers is solicited in locating the following members, mail to whom has been returned to the Association's central office. The last known address of each is given. Should you be able to provide information as to present residence, your advice via postcard or letter will be greatly appreciated.

Andersen, Andrew C. P., P. O. Box 37, Shellyville, Tenn.

Ashman, Robert Irving, Jr., Naval Air Station, Norfolk, Va.

Attaway, Ray S., 422 Vermont St., Waterloo, Iowa.

Bogen, Sidney, 4843 Reister-Town Rd., Baltimore, Md.

Broussard, Geo. P., 417 E. Main St., New Iberia, La.

Castro, Fred, General Delivery, Omaha, Neb.

DeMott, Andre R., Utica St., DeRuyter, N. Y.

Dennie, F. W., 1519-41st Pl., Des Moines, Iowa.

Griffith, Robert L., General Delivery, Inverness, Calif.

Hess, Henry E., Fort Devens, Mass.

Hoppenstedt, Gilbert, Millar Animal Hosp., Deal, N. J.

Hutchinson, Morton D., 420 Remington St., Fort Collins, Colo.

Israel, Irving, 150 W. Euclid St., Detroit, Mich.

Jackson, L. L., City Health Dept., San Antonio, Texas.

Keown, G. H., 1420 Elford St., Victoria, B. C., Can.

Loomis, Ralph E., 10 Main St., Wellsboro, Pa.

Mathis, Rudy C., State Veterinarian, Atlanta, Ga.

Mesenbrink, R. L., General Delivery, Kirksville, Mo.

Morgan, William D., Box 204, Enterprise, Ore.

Murphy, Claude F., Box 339, South Omaha Station, Neb.

Newhart, Charles C., 6731 S. Union Ave., Chicago, Ill.

Olson, Philip C., 914 W. Walnut St. Yakima, Wash.

Renfrow, Charles, Station Hospital, Pendleton Field, Ore.

Schendel, Samuel A., Richmond, Kansas.

Spears, C. J. Dublin Ga.

Underwood, H. W. 121 Market St., Clearfield, Pa.

Vanderbilt, W. H., 708 E. Trinity, Durham, N. Car.

Zeldner, Joseph, 150 W. Euclid, Detroit, Mich.

Zinober, Moses R., 1047 Post Office Bldg., St. Paul, Minn.

**NEW DATES AND HEADQUARTERS FOR 79TH ANNUAL MEETING: AUGUST 24-27, 1942—PALMER HOUSE, CHICAGO
SEE PAGES**

APPLICATIONS

First Listing*

ANTLES, F. H.
4th Ave. Dog & Cat Hospital, 2420 Fourth Ave., Seattle, Wash.
D.V.M., State College of Washington, 1920.
Vouchers: E. E. Wegner and E. A. Ehmer.

BABB, W. F.
Utica, Ohio.
D.V.M., Ohio State University, 1925.
Vouchers: F. A. Zimmer and W. F. Guard.

BAILEY, EARL G.
Dexter, Mo.
D.V.M., Kansas City Veterinary College, 1918.
Vouchers: S. W. Haigler and J. C. Flynn.

BLAKEFIELD, H. W.
726 Spring St., Berlin, Wis.
D.V.M., Chicago Veterinary College, 1918.
Vouchers: James S. Healy and W. R. Winner.

COLLINS, JOHN BERNARD
218 Island St., Chippewa Falls, Wis.
D.V.M., Chicago Veterinary College, 1912.
Vouchers: James S. Healy and W. Wisnicky.

COLLINS, ROY L.
47 Kenwood St., Pittsfield, Mass.
D.V.M., McKillip Veterinary College, 1917.
Vouchers: H. E. Dapson and E. O. Brielman.

CONWAY, JAMES C.
Box 182, Fort Branch, Ind.
D.V.M., Terre Haute Veterinary College, 1917.
Vouchers: Harry Seevers and C. C. Dobson.

COPPLE, E. DON
2212 Main St., Boise, Idaho.
D.V.M., State College of Washington, 1937.
Vouchers: P. S. Hannah and G. C. Holm.

COSGRIFF, PATRICK F.
299 Bloomfield Ave., Verona, N. J.
V.M.D., University of Pennsylvania, 1939.
Vouchers: R. P. Lawrence and J. J. Devine.

COTTRAL, GEORGE E.
Veterinary Station Hospital, Fort Sheridan, Ill.
D.V.M., Kansas State College, 1938.
Vouchers: C. A. Brandly and F. Thorp, Jr.

CRANE, ALBERT J.
Ridge Road, Glens Falls, N. Y.
Cornell University, 1937.
Vouchers: E. R. Cushing and L. W. Goodman.

CROSS, FLOYD
711 Mathews St., Fort Collins, Colo.
D.V.S., Colorado State College, 1914.
Vouchers: I. E. Newsom and J. Farquharson.

EDMONDS, ELMER V.
922 N. Kingsley Dr., Los Angeles, Calif.
D.V.M., State College of Washington, 1911.
Vouchers: W. L. Curtis and L. M. Hurt.

EHRLICH, DAVID
2608 Ave. I, Brooklyn, N. Y.

D.V.M., Cornell University, 1935.
Vouchers: B. A. Seeley and Herman Tax.

GALE, JOHN
Station Hospital, Camp Langdon, N. H.
D.V.M., Ohio State University, 1934.
Vouchers: Martin Kadets and L. W. Groves.

GOLDMAN, HEINZ
3401 Wayne, Kansas City, Mo.
D.V.M., University of Berne, Switzerland, 1938.
Vouchers: H. E. Carver and J. Porter Coble.

GRIESINGER, EDWARD
1825 S. 1st St., Rt. No. 7, Yakima, Wash.
D.V.M., St. Joseph Veterinary College, 1918.
Vouchers: M. O. Barnes and H. W. Marsden.

HARMS, H. F., JR.
137 Piermont Rd., Closter, N. J.
V.M.D., University of Pennsylvania, 1931.
Vouchers: J. R. Porteus and J. T. McGrann.

HELMING, ROBERT B.
Cresco, Iowa.
D.V.M., Kansas State College, 1931.
Vouchers: C. C. Franks and A. H. Quin.

HENINGER, FENTON C.
Newark, Ill.
D.V.M., McKillip Veterinary College, 1913.
Vouchers: J. G. Blum and C. C. Hastings.

HENLEY, C. A.
232 S. East St., Jacksonville, Ill.
D.V.M., Ohio State University, 1925.
Vouchers: C. C. Hastings and L. A. Merilla.

HOLMES, LYNNE F.
Box 364, Appleton, Wis.
D.V.M., Chicago Veterinary College, 1916.
Vouchers: James S. Healy and W. R. Winner.

HOOD, HARVEY B.
P. O. Box 149, Kingstree, S. Car.
V.M.D., University of Pennsylvania, 1903.
Vouchers: W. K. Lewis and R. A. Mays.

HOOVER, CLARENCE DALE
349 Mariposa Ave., Stockton, Calif.
D.V.M., Indiana Veterinary College, 1913.
Vouchers: D. E. Settle and F. H. Saunders.

JACOBSON, HARVEY W.
Denmark, Wis.
D.V.M., Chicago Veterinary College, 1917.
Vouchers: James S. Healy and W. R. Winner.

JOHNSON, J. A.
300 S. Brighton Ave., Kansas City, Mo.
D.V.M., Ohio State University, 1934.
Vouchers: F. A. Imler and M. F. Wallace.

JONES, J. L.
Blackburn, Mo.
D.V.M., Kansas City Veterinary College, 1913.
Vouchers: S. W. Haigler and J. C. Flynn.

KEEFE, FRED
318 Broad St., Lynn, Mass.
B.V.Sc., Ontario Veterinary College, 1935.
Vouchers: L. A. Paquin and Max H. Carlin.

*See July 1942 issue, p. 54.

- KERR, O. W.
501 N. Center St., Turlock, Calif.
D.V.M., San Francisco Veterinary College, 1914.
Vouchers: W. L. Curtis and J. L. Tyler.
- KLEINECK, ROY J.
Onslow, Iowa.
D.V.M., McKillip Veterinary College, 1920.
Vouchers: R. E. Elson and Iva Dunn.
- KLOFANDA, ROYAL
210 Reed St., Chilton, Wis.
D.V.M., McKillip Veterinary College, 1915.
Vouchers: James S. Healy and W. R. Winner.
- KORINEK, A. W.
909 S. W. 12th Ave., Portland, Ore.
B.V.Sc., Ontario Veterinary College, 1910.
Vouchers: G. H. Huthman and C. A. Bjork.
- LAHS, P. C.
Mexico, Mo.
D.V.M., St. Joseph Veterinary College, 1923.
Vouchers: S. W. Haigler and G. E. Bartholomews.
- LOHMEYER, CARL
Somerset Veterinary Infirmary, Somerville, N. J.
D.V.M., Ohio State University, 1938.
Vouchers: R. N. G. Darby and J. R. Porteus.
- LONGLEY, O. A.
2024 Lombard St., San Francisco, Calif.
D.V.S., San Francisco Veterinary College, 1903.
Vouchers: J. L. Tyler and Howard Carroll.
- MCGREEVY, A. F.
510 W. 19th, Sioux City, Iowa.
D.V.M., Grand Rapids Veterinary College, 1915.
Vouchers: H. G. Smith and J. C. Flynn.
- McKINNON, J. M.
Sanford, N. Car.
D.V.M., Alabama Polytechnic Institute, 1937.
Vouchers: J. I. Neal and J. H. Brown.
- McKITTRICK, J. A.
Box III, Lee's Summit, Mo.
D.V.M., Kansas State College, 1922.
Vouchers: J. L. Wells and Glen L. Dunlap.
- MACHADO, A. V.
Escola Superior de Veterinaria—Gameleira.
Caixa Postal, 567, Belo Horizonte—Estado de Minas, Brazil, S. A.
D.V.M., Escola Superior de Agricultura e Veterinaria, Vicosa, 1938.
Vouchers: R. C. Dunn and J. G. Hardenbergh.
- MAY, GLEN H.
West Point, Ind.
D.V.M., Ohio State University, 1938.
Vouchers: J. L. Kixmiller and F. H. Brown.
- MOFFITT, JAMES T.
1733 Brook Rd., Highland Park, Ill.
D.V.M., Indiana Veterinary College, 1918.
Vouchers: L. A. Merillat and J. G. Hardenbergh.
- MUDD, REX O.
497 S. Elm Ave., Kankakee, Ill.
D.V.M., McKillip Veterinary College, 1919.
Vouchers: C. E. Fiddler and C. C. Hastings.
- OFFICER, CHARLES C.
Box 368, Ferris, Tex.
D.V.M., Colorado State College, 1914.
Vouchers: A. C. Burns and H. Schmidt.
- PALMER, T. E.
204 W. Main St., Casey, Ill.
D.V.M., Indiana Veterinary College, 1910.
Vouchers: W. B. Holmes and W. N. Cochran.
- PINFOLD, R. W.
Waialae Ranch, Kalaniana'ole Highway, Waialae, Oahu, T. H.
D.V.M., Ohio State University, 1941.
Vouchers: E. H. Willers and J. G. Hardenbergh.
- PIRIE, LESLIE DANIEL
Box 72, Riverdale, Calif.
D.V.M., San Francisco Veterinary College, 1914.
Vouchers: J. M. Arburua and R. B. Griffenhagen.
- POWELL, EDWIN T.
2207 Ellis Ave., Boise, Idaho.
D.V.M., State College of Washington, 1910.
Vouchers: H. W. Jakeman and Glenn C. Holm.
- RAMSEY, S. V.
1093 N. E. 79th St., Miami, Fla.
D.V.M., Terre Haute Veterinary College, 1912.
Vouchers: M. W. Emmel and D. A. Sanders.
- REYNOLDS, U. B.
Ft. Branch, Ind.
D.V.S., Western Veterinary College, 1902.
Vouchers: Harry Seevers and W. G. Hunter.
- RICHARDS, W. L.
Morrisonville, Wis.
D.V.M., Chicago Veterinary College, 1914.
Vouchers: James S. Healy and W. R. Winner.
- ROBERTSON, L. L.
Argyle, Wis.
D.V.M., Chicago Veterinary College, 1915.
Vouchers: James S. Healy and W. R. Winner.
- ROYER, B.
404 S. Franklin St., Shawano, Wis.
V.S., Ontario Veterinary College, 1898.
Vouchers: James S. Healy and W. R. Winner.
- STRAIT, P. F.
301 S. Water St., Sparta, Wis.
D.V.M., McKillip Veterinary College, 1913.
Vouchers: James S. Healy and W. R. Winner.
- STROEHLEIN, C. F.
4710 Howard Ave., Cincinnati, Ohio.
D.V.M., U. S. College of Veterinary Surgeons, 1923.
Vouchers: Max Sieveveld and W. W. Renter.
- TARNOW, F. W.
130 East St., Bedford, Pa.
V.M.D., University of Pennsylvania, 1929.
Vouchers: V. C. Moyer and W. H. Ivens.
- TAYLOR, ALBERT M.
P. O. Box 342, Phoenix, Ariz.
M.D.C., Chicago Veterinary College, 1897.
Vouchers: W. L. Curtis and W. R. Lee.

- THOM, E. G.
6620 20th Ave., Kenosha, Wis.
D.V.M., Chicago Veterinary College, 1913.
Vouchers: James S. Healy and W. R. Winner.
- TOPHAM, JOSEPH L.
Oregon, Wis.
B.V.Sc., Ontario Veterinary College, 1936.
Vouchers: James S. Healy and W. R. Winner.
- TREMAN, C. E.
Rockwell City, Iowa.
D.V.M., Iowa State College, 1930.
Vouchers: J. D. Reardon and C. C. Franks.
- WARD, T. A.
Carlisle Barracks, Carlisle, Pa.
D.V.M., Texas A. & M. College, 1928.
Vouchers: J. G. Fuller and H. Schmidt.
- WEBB, G. C.
1203 Milwaukee St., Kewaunee, Wis.
V.S., Ontario Veterinary College, 1903.
Vouchers: James S. Healy and W. R. Winner.
- WHITLOCK, R. F.
Monett, Mo.
D.V.M., Kansas City Veterinary College, 1918.
Vouchers: G. E. Bartholomees and L. A. Merillat.
- WINGERTER, A. R.
R. R. No. 1, Big Rapids, Mich.
D.V.M., Michigan State College, 1927.
Vouchers: H. H. Ruhland and C. F. Clark.
- WOODWARD, B. T.
2315 Riverside Dr., Santa Ana, Calif.
V.M.D., University of Pennsylvania, 1902.
Vouchers: J. L. Tyler and L. G. Clark.
- WRIGGLESWORTH, G. B.
106 Gibson St., Eau Claire, Wis.
V.S., Ontario Veterinary College, 1908.
Vouchers: V. S. Larson and James S. Healy.
- YOUMANS, RAY S.
Veterinary Hospital, Fort Knox, Ky.
D.V.M., Cornell University, 1914.
Vouchers: H. W. Jakeman and J. G. Hardenbergh.
- ZIMMERMAN, H. E.
1015 Quindaro, Kansas City, Kansas.
D.V.S., Kansas City Veterinary College, 1908.
Vouchers: S. L. Stewart and L. A. Merillat.

Second Listing

- Atkins, Hazen S., Lewiston, Idaho.
Barnett, R. E., Martinsville, Ind.
Bild, Elmer J., Randolph, Neb.
Butler, Clair L., Easton, Md.
Case, Ralph W., Phoenix, Ariz.
Downing, Melvin Wilford, Waukesha, Wis.
Edwards, David R. Fox Lake, Wis.
Evans, L. A., Essex Junction, Vt.
Farrell, Justin James, Lake Mills, Wis.
Hartle, L. V., Worthington, Minn.
Haushalter, A. M., Menomonee Falls, Wis.
Johnston, E. D., Mission, Kansas.
Maier, H. K., Beaumont, Texas.
Martinson, V. V., Milwaukee, Wis.
Metz, John J. Jr., Tampa, Fla.
Mirsky, Leonard, Bradford, Pa.
Monk, T. A., Goldsboro, N. Car.
- Newman, L. V., Racine, Wis.
Novy, Vit James, Belleville, Ill.
Olson, A. T., Milwaukee, Wis.
Pinkert, R. E., Grafton, Wis.
Powers, Edwin M., Bradford, Vt.
Hojas, C. A., Bogota, Colombia, South America.
Rueter, George W., Berthoud, Colo.
Schneckloth, T. A., Sr., Lodi, Wis.
Schneckloth, T. A., Jr., Green Bay, Wis.
Shraiberg, S. G., Denver, Colo.
Smith, C. L., Washington, Ga.
Snow, Donald M., Springfield, Mass.
Steuber, Lawrence J., Prairie du Sac, Wis.
Strothman, William G., Brookville, Ind.
Trudeau, Armand E., Holyoke, Mass.
Walsdorf, I. A., New Holstein, Wis.
Weckler, Harry A., Chicago, Ill.
Witt, R. F., Worcester, Mass.

In lieu of reprinting the several hundred names of 1942 veterinary graduates whose applications were given first listing in the July JOURNAL, members are referred to pages 55-64 of that issue for the names, addresses, schools and vouchers of said applicants. This notice shall be considered, in effect, the second listing of the applicants in question.

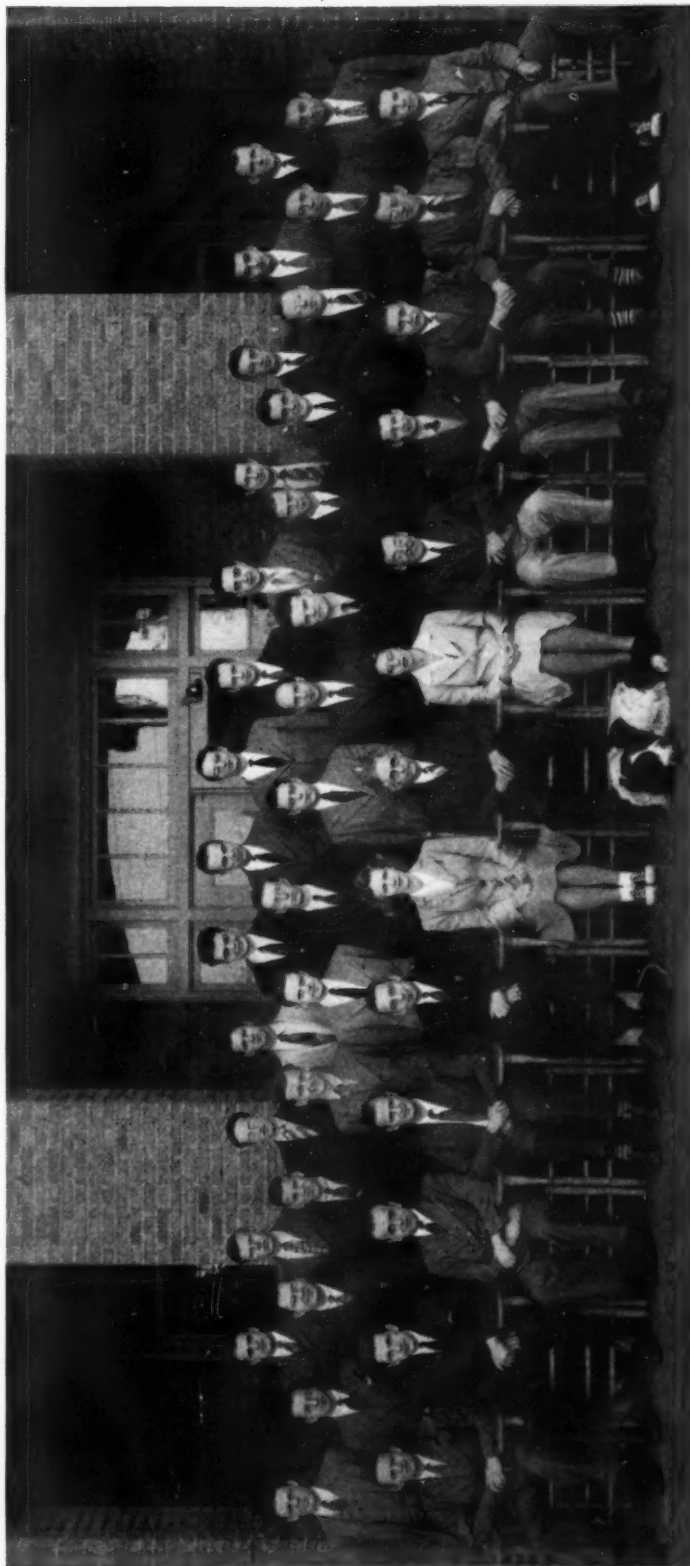
1942 Graduate Applicants (First Listing) Cornell University*

- ARMSTRONG, JAMES, D.V.M.
R.D. No. 6, Schenectady, N. Y.
Vouchers: H. C. Stephenson and A. B. Hoerlein.
- BAXTER, CLINTON M., D.V.M.
R.D. No. 2, Union, N. Y.
Vouchers: H. J. Milks and F. O. Wright.
- BLOSTEIN, LEON I., D.V.M.
411 Cascadilla St., Ithaca, N. Y.
Vouchers: H. J. Milks and H. C. Stephenson.
- COMIN, RALPH, D.V.M.
95-26 118th St., Richmond Hill, N. Y.
Vouchers: H. H. Dukes and H. C. Stephenson.
- FRASER, GORDON S., D.V.M.
c/o Mrs. Peter Fraser, 117-36, 196th St.
St. Albans, L. I., N. Y.
Vouchers: A. G. Danks and H. C. Stephenson.
- GILMOUR, JUDD T., D.V.M.
43 Central Parkway, Mt. Vernon, N. Y.
Vouchers: H. C. Stephenson and A. G. Danks.
- HALLER, CHRISTIAN J., D.V.M.
108 S. Quarry St., Ithaca, N. Y.
Vouchers: A. G. Danks and H. H. Dukes.
- HANDLER, PAUL, D.V.M.
710 Stewart Ave., Ithaca, N. Y.
Vouchers: H. C. Stephenson and A. G. Danks.
- JONES, ARTHUR J., D.V.M.
Route No. 2, Remsen, N. Y.
Vouchers: M. G. Fincher and H. C. Stephenson.
- KANE, JOSEPH R., D.V.M.
4 Grace St., Johnstown, N. Y.
Vouchers: H. C. Stephenson and H. J. Milks.

*Entire graduating class applied for membership.

CORNELL UNIVERSITY

Class of 1942



Back Row (Left to Right)—A. R. Martin, L. A. Wager, C. D. Vedder, Jr., J. R. Kane, C. J. Haller, R. Saunders, P. Handler, B. Sann, L. E. Blostein, H. G. Scheffler, C. E. Mustus, H. Kopp, H. C. Phelps.
 Second Row (Left to Right)—H. S. White, R. Comin, E. H. Peterson, M. G. Smith, G. S. Solnitz, J. T. Gilmour, H. N. Lasher, L. Leveson, A. M. Rubenstein, D. L. Proctor, Jr., J. Armstrong, C. M. Baxter, A. J. Jones, L. N. Mick, J. P. Rieber.
 Front Row (Left to Right)—D. J. Steed, F. B. Pulling, Jr., R. E. May, P. W. Ucko, G. E. Morse, Mrs. R. E. Loomis, Dr. D. H. Udall, Miss J. Mackerly, W. P. Schwobel, G. S. Fraser, L. A. Wuori, R. D. Smith, W. I. Newton. Missing from Picture: C. R. Leahy and E. R. Maschgan. The class applied for membership in the AVMA 100 percent.

- KOPP, HAROLD, D.V.M.
Woodridge, N. Y.
Vouchers: H. J. Milks and H. C. Stephenson.
- LEAHY, CHARLES R., D.V.M.
Whitney Point, N. Y.
Vouchers: F. O. Wright and H. C. Stephenson.
- LEVESON, LAWRENCE, D.V.M.
63 Knox Ave., Buffalo, N. Y.
Vouchers: H. C. Stephenson and M. G. Fincher.
- LOOMIS, GRACE K., D.V.M.
133 W. Court St., Warsaw, N. Y.
Vouchers: H. C. Stephenson and H. J. Milks.
- MACKERLEY, JEAN, D.V.M.
36 Linwood Ave., Newton, N. J.
Vouchers: H. J. Milks and H. C. Stephenson.
- MARTIN, ANSEL R., D.V.M.
3 Garden Ave., Ithaca, N. Y.
Vouchers: H. J. Milks and H. C. Stephenson.
- MASCHGAN, ERICH R., D.V.M.
218 E. 80th St., New York, N. Y.
Vouchers: H. C. Stephenson and P. Olafson.
- MAY, ROBERT E., D.V.M.
Webster Crossing, N. Y.
Vouchers: H. C. Stephenson and H. J. Milks.
- MICK, LESTER, D.V.M.
Petersboro, N. Y.
Vouchers: M. E. Miller and H. C. Stephenson.
- MORSE, GUY E., D.V.M.
Marathon, N. Y.
Vouchers: H. L. Gilman and H. J. Milks.
- MUSKUS, CLAUDIO E., D.V.M.
P. O. Box 993, Caracas, Venezuela, S. A.
Vouchers: H. C. Stephenson and A. G. Danks.
- NEWTON, WRIGHT I., D.V.M.
New York State Veterinary College, Cornell University, Ithaca, N. Y.
Vouchers: A. G. Danks and H. C. Stephenson.
- PETERSON, ELWIN H., D.V.M.
138 Linden Ave., Ithaca, N. Y.
Vouchers: H. J. Milks and H. C. Stephenson.
- PHELPS, HAROLD C., D.V.M.
106 Garfield Ave., Endicott, N. Y.
Vouchers: H. C. Stephenson and H. J. Milks.
- PROCTOR, D. L., JR., D.V.M.
171 N. Upper St., Lexington, Ky.
Vouchers: W. W. Dimock and F. E. Hull.
- PULLING, FRED B., JR., D.V.M.
Lagrangeville, N. Y.
Vouchers: L. W. Woodworth and G. L. Stringham.
- RIEBER, JESSE PAUL, D.V.M.
245 W. 25th St., New York, N. Y.
Vouchers: Wm. A. Hagan and H. C. Stephenson.
- RUBENSTEIN, ABRAHAM M., D.V.M.
1660 Topping Ave., Bronx, N. Y.
Vouchers: M. E. Miller and M. G. Fincher.
- SANN, BENJAMIN, D.V.M.
1555 Unionport Rd., New York, N. Y.
Vouchers: H. C. Stephenson and C. E. Hayden.
- SAUNDERS, RICHARD, D.V.M.
Main St., Clarence, N. Y.
Vouchers: H. J. Milks and H. C. Stephenson.
- SCHEFFLER, HAROLD GEORGE, D.V.M.
136-21 Hillside Ave., Jamaica, L. I., N. Y.
Vouchers: H. J. Milks and F. O. Wright.
- SCHWOBEL, W., D.V.M.
8640 139th St., Jamaica, New York, N. Y.
Vouchers: H. C. Stephenson and A. G. Danks.
- SMITH, MERWIN G., D.V.M.
122 Grove Ave., Albany, N. Y.
Vouchers: H. C. Stephenson and A. G. Danks.
- SMITH, ROBERT D., D.V.M.
Bristol, Vt.
Vouchers: A. G. Danks and H. C. Stephenson.
- SOLMITZ, GERHARD S., D.V.M.
122 Catherine St., Ithaca, N. Y.
Vouchers: A. G. Danks and H. C. Stephenson.
- STEED, DONALD J., D.V.M.
50 Lusk St., Johnson City, N. Y.
Vouchers: H. J. Milks and H. C. Stephenson.
- UCKO, PETER W., D.V.M.
304 Bryant Ave., Ithaca, N. Y.
Vouchers: A. G. Danks and C. E. Hayden.
- VEDDER, C. D., JR., D.V.M.
Fonda, N. Y.
Vouchers: D. H. Udall and M. G. Fincher.
- WAGER, LESLIE, D.V.M.
King Ferry, N. Y.
Vouchers: H. C. Stephenson and H. J. Milks.
- WEISS, LEONARD, D.V.M.
90-20 169 St., Jamaica, N. Y.
Vouchers: Wm. A. Hagan and H. C. Stephenson.
- WHITE, HOWARD S., D.V.M.
302 Bryant Ave., Ithaca, N. Y.
Vouchers: Wm. A. Hagan and H. C. Stephenson.
- WUORI, LEO A., D.V.M.
Box 31, North Salem, N. Y.
Vouchers: Wm. A. Hagan and H. C. Stephenson.

Iowa State College

- ESTES, CARL E., D.V.M.
Northboro, Iowa.
Vouchers: H. D. Bergman and W. G. Venzke.
- GILMORE, DON F., D.V.M.
Oil Center, Ky.
Vouchers: G. R. Fowler and G. W. Cornwall.
- KRUGER, GORDON J., D.V.M.
609 W. Church, Champaign, Ill.
Vouchers: J. Sampson and G. Raps.
- WHITE, DARRELL T., D.V.M.
Williamsburg, Iowa.
Vouchers: H. D. Bergman and G. R. Fowler.

Michigan State College*

- DE MERITT, DONALD E., D.V.M.
Packard Rd., Hudson, Mich.
Vouchers: C. F. Clark and B. J. Killham.

*Entire graduating class applied for membership.

ETCHISON, K. L., D.V.M.
924 S. Pine St., Lansing, Mich.
Vouchers: C. F. Clark and J. G. Hardenbergh.

FLUHARTY, D. M., D.V.M.
Consolidated Badger, Shawano, Wis.
Vouchers: C. F. Clark and B. J. Killham.

HAUSER, FRED, D.V.M.
Middleville, Mich.
Vouchers: C. F. Clark and B. J. Killham.

HOUGHTEN, WILLIAM A., D.V.M.
222½ N. Walnut Ave., Bryan, Ohio.
Vouchers: C. F. Clark and B. J. Killham.

HUMERICKHOUSE, ROLAND V., D.V.M.
1901 W. Saginaw, Lansing, Mich.
Vouchers: C. F. Clark and B. J. Killham.

KRAUS, LEO G., D.V.M.
Metamora, Ohio.
Vouchers: C. F. Clark and B. J. Killham.

KRINSKY, LEONARD D., D.V.M.
3701 Cedardale Rd., Baltimore, Md.
Vouchers: C. F. Clark and B. J. Killham.

MILLER, DONALD L., D.V.M.
R.F.D. No. 1, Lake City, Mich.
Vouchers: C. F. Clark and B. J. Killham.

PERKINS, CHESTER A., D.V.M.
Mukwonago, Wis.
Vouchers: C. F. Clark and B. J. Killham.

PERKINS, FREDERICK E., D.V.M.
1801 St. Denis Ave., Norfolk, Va.
Vouchers: C. F. Clark and B. J. Killham.

STARKEY, ARTHUR LYLE, D.V.H.
642 Evergreen, East Lansing, Mich.
Vouchers: C. F. Clark and B. J. Killham.

Ohio State University

BAKER, ROBERT F., D.V.M.
23 W. Lane Ave., Columbus, Ohio.
Vouchers: W. F. Guard and P. A. Soldner.

BENEDICT, MELVIN C., D.V.M.
1050 Wooster Ave., Akron, Ohio.
Vouchers: W. F. Guard and P. A. Soldner.

BENNETT, ROTHBEE H., D.V.M.
1016 Parsons Ave., Columbus, Ohio.
Vouchers: W. F. Guard and P. A. Soldner.

BOLTON, WILLIAM O., D.V.M.
829 S. North St., Washington C. H., Ohio.
Vouchers: W. F. Guard and P. A. Soldner.

BRIDENSTINE, W. A., D.V.M.
West Jefferson, Ohio.
Vouchers: W. F. Guard and P. A. Soldner.

BRITTON, ALLAN Q., D.V.M.
2416 Broadway, Toledo, Ohio.
Vouchers: W. F. Guard and P. A. Soldner.

CARLIN, LOUIS, D.V.M.
10617 Earle Ave., Cleveland, Ohio.
Vouchers: W. F. Guard and P. A. Soldner.

CLYMER, ELZA E., D.V.M.
107½ W. Washington St., Napoleon, Ohio.
Vouchers: W. F. Guard and P. A. Soldner.

COBLE, MARVIN M., D.V.M.
110 W. Jackson St., Columbia City, Ind.
Vouchers: W. F. Guard and P. A. Soldner.

CRAGO, V. G., D.V.M.
Rural Rt. No. 1, Chagrin Falls, Ohio.
Vouchers: W. F. Guard and P. A. Soldner.

DAVIS, JAMES R., D.V.M.
Hardinsburg, Ind.
Vouchers: W. F. Guard and P. A. Soldner.

DELAFLANE, FRANK, D.V.M.
R. R. No. 1, Greenville, Ohio.
Vouchers: W. F. Guard and P. A. Soldner.

DICK, JOHN R., D.V.M.
Chapel Hill Rd., R. No. 4, Bethlehem,
Wheeling, W. Va.
Vouchers: W. F. Guard and P. A. Soldner.

ENGARD, RICHARD M., D.V.M.
117 N. Maple St., Marysville, Ohio.
Vouchers: W. F. Guard and P. A. Soldner.

FOLEY, R. JAMES, D.V.M.
1109 Woodbourne Ave., Brookline, Pitts-
burgh, Pa.
Vouchers: W. F. Guard and P. A. Soldner.

FRIEDBURG, KLAUS M., D.V.M.
c/o Gordon Animal Hospital,
8210 S. Ashland Ave., Chicago, Ill.
Vouchers: W. F. Guard and P. A. Soldner.

GARVERICK, WADE, D.V.M.
c/o Gar Smith, Mt. Gilead, Ohio.
Vouchers: W. F. Guard and P. A. Soldner.

GLOVER, ROBERT C., D.V.M.
7645 Delmar Blvd., St. Louis, Mo.
Vouchers: W. F. Guard and P. A. Soldner.

GROSS, IRWIN, D.V.M.
1120 Lakeview Rd., Cleveland, Ohio.
Vouchers: W. F. Guard and P. A. Soldner.

HARRIES, CHESTER E., D.V.M.
Hurley, Wis.
Vouchers: W. F. Guard and P. A. Soldner.

HARTER, HEROLD M., JR., D.V.M.
Rt. No. 1, Toledo, Ohio.
Vouchers: W. R. Krill and W. F. Guard.

HICKS, JOSEPH M., D.V.M.
14 Key St., Hillsboro, Ohio.
Vouchers: W. F. Guard and P. A. Soldner.

HILDEBRAND, WILLIAM M., D.V.M.
901 Boone St., Pique, Ohio.
Vouchers: W. F. Guard and P. A. Soldner.

INGALLS, WILLIAM L., D.V.M.
Galloway, Ohio.
Vouchers: W. F. Guard and P. A. Soldner.

JOHNSON, LEROY E., D.V.M.
274 E. 13th Ave., Columbus, Ohio.
Vouchers: W. F. Guard and P. A. Soldner.

KEENE, PAUL M., D.V.M.
Shabbona, Ill.
Vouchers: W. F. Guard and P. A. Soldner.

KNOBLE, JOSEPH F., D.V.M.
R. R. No. 2, Floyd Knobs, Ind.
Vouchers: W. F. Guard and P. A. Soldner.

LAMKIN, WILLIAM E., D.V.M.
Patriot, Ind.
Vouchers: H. E. Myers and A. L. Miller.

LESTER, GARDINER A., D.V.M.
428 Summer Ave., Reading, Mass.
Vouchers: W. F. Guard and P. A. Soldner.



The 1942 class of Michigan State College is one among several of this year's graduating classes which has applied, 100 per cent, for membership in the AVMA.

LIVINGSTON, ROBERT M., D.V.M.

Urbana, Ohio.

Vouchers: W. F. Guard and P. A. Soldner.

LYDAY, CHARLES V., D.V.M.

226 Buttles Ave., Columbus, Ohio.

Vouchers: W. F. Guard and P. A. Soldner.

MCCLASKEY, WALTER D., D.V.M.

Rt. No. 1, Prospect, Ohio.

Vouchers: W. F. Guard and P. A. Soldner.

MAIRS, ROBERT, D.V.M.

Shreve, Ohio.

Vouchers: W. F. Guard and P. A. Soldner.

MILLER, JOHN G., D.V.M.

LaCenter, Ky.

Vouchers: W. F. Guard and P. A. Soldner.

MINGLE, HUGH F., D.V.M.

c/o Wayne West, R.R. No. 7, Anderson, Ind.

Vouchers: W. F. Guard and P. A. Soldner.

NORRIS, WILLIAM E., D.V.M.

Rt. No. 3, Coshocton, Ohio.

Vouchers: W. F. Guard and P. A. Soldner.

PADEN, CLARENCE E., JR., D.V.M.

1017 DeMaude Ave., South Bend, Ind.

Vouchers: W. F. Guard and P. A. Soldner.

PLACE, ROBERT A., D.V.M.

132 N. Main St., St. Marys, Ohio.

Vouchers: W. F. Guard and P. A. Soldner.

PRUSHING, LEROY C., D.V.M.

Rt. No. 2, Worthington, Ohio.

Vouchers: W. F. Guard and P. A. Soldner.

PUGH, PAUL H., D.V.M.

1221 S. High St., Columbus, Ohio.

Vouchers: W. F. Guard and P. A. Soldner.

RANGE, JOHN C., D.V.M.

Wapakoneta, Ohio.

Vouchers: W. F. Guard and P. A. Soldner.

REINECK, FREDERICK C., D.V.M.

321 E. Yeasting St., Gibsonburg, Ohio.

Vouchers: W. F. Guard and P. A. Soldner.

RHINEBARGER, ROY R., D.V.M.

3020 Westerville Rd., Columbus, Ohio.

Vouchers: W. F. Guard and P. A. Soldner.

SEWARD, CHARLES O., D.V.M.


707 Veneta Ave., Bremerton, Wash.

Vouchers: W. F. Guard and P. A. Soldner.

SHARP, JOHN C., D.V.M.

Rt. No. 2, Worthington, Ohio.

Vouchers: W. F. Guard and P. A. Soldner.


 STEIN, IRVING M., D.V.M.

12825 Kingsman Rd., Cleveland, Ohio.

Vouchers: W. F. Guard and P. A. Soldner.

SWITZER, ERNEST E., D.V.M.

Andover, Ohio.

Vouchers: W. F. Guard and P. A. Soldner.

WELTY, KENNETH D., D.V.M.

West Mansfield, Ohio.

Vouchers: W. F. Guard and P. A. Soldner.

WILCOX, WILLIAM A., D.V.M.

778 E. 4th St., South Boston, Mass.

Vouchers: W. F. Guard and P. A. Soldner.

WILLIAMSON, F. M., D.V.M.

Montpelier, Ind.

Vouchers: W. F. Guard and P. A. Soldner.

WILLIAMSON, RICHARD L., D.V.M.

303 E. Washington St., Hartford City, Ind.

Vouchers: W. F. Guard and P. A. Soldner.

University of Pennsylvania

RAKER, CHARLES W., D.V.M.

Berwyn P. O., Daylesford, Pa.

Vouchers: D. G. Lee and T. J. Gasser.

Texas A. & M. College

MICHAELS, VICTOR W., D.V.M.

450 Beach 69 St., Arverne, N. Y.

Vouchers: J. H. Milliff and F. P. Jaggi, Jr.

U. S. GOVERNMENT

Organization of the United States Department of Agriculture as of July, 1942

Secretary of Agriculture.....	CLAUDE R. WICKARD.
Under Secretary	PAUL H. APPLEBY.
Assistant Secretary	GROVER B. HILL.
Land Use Coördinator.....	M. S. EISENHOWER.
Director of Agricultural Defense Relations.....	M. CLIFFORD TOWNSEND.
Solicitor	MASTIN G. WHITE.
Director of Personnel.....	JAMES L. BUCKLEY, <i>Acting</i> .
Director of Finance, and Budget Officer.....	W. A. JUMP.
Director of Information.....	MORSE SALISBURY.
Director of Research and Chief Office of Ex- periment Stations.	JAMES T. JARDINE.
Director of Extension Work.....	M. L. WILSON.
Director of Marketing.....	ROY F. HENDRICKSON.
Director of Foreign Agricultural Relations.....	LESLIE A. WHEELER.
Office of C. C. C. Activities (Chief).....	FRED W. MORRELL.
Office of Plant and Operations (Chief).....	ARTHUR B. THATCHER.
Department Librarian	RALPH R. SHAW.
Agricultural Adjustment Administration.....	R. M. EVANS, <i>Administrator</i> .
Bureau of Agricultural Chemistry and Engi- neering.	HENRY G. KNIGHT, <i>Chief</i> .
Bureau of Agricultural Economics.....	H. R. TOLLEY, <i>Chief</i> .
Agricultural Marketing Service.....	C. W. KITCHEN, <i>Chief</i> .
Bureau of Animal Industry.....	JOHN R. MOHLER, <i>Chief</i> .
Commodity Credit Corporation.....	J. B. HUTSON, <i>President</i> .
Commodity Exchange Administration.....	JOSEPH M. MEHL, <i>Chief</i> .
Bureau of Dairy Industry.....	O. E. REED, <i>Chief</i> .
Bureau of Entomology and Plant Quarantine..	P. N. ANNAND, <i>Chief</i> .
Farm Credit Administration.....	A. G. BLACK, <i>Governor</i> .
Farm Security Administration.....	C. B. BALDWIN, <i>Administrator</i> .
Federal Crop Insurance Corporation.....	LEROY K. SMITH, <i>Manager</i> .
Forest Service	EARLE H. CLAPP, <i>Acting Chief</i> .
Bureau of Home Economics.....	LOUISE STANLEY, <i>Chief</i> .
Bureau of Plant Industry.....	E. C. AUCHTER, <i>Chief</i> .
Rural Electrification Administration.....	HARRY SLATTERY, <i>Administrator</i> .
Soil Conservation Service	H. H. BENNETT, <i>Chief</i> .
Surplus Marketing Administration.....	ROY F. HENDRICKSON, <i>Administrator</i> .

Radical Changes in the USDA "For the Duration"

Under executive order issued by President Roosevelt in February, 1942, the following mergers within the Department of Agriculture will be in force until six months after the war ends.

1) The Surplus Marketing Administration, including the Federal Surplus Commodities Corp., the Agricultural Marketing Service (except the agricultural statistics division), and the Commodity Exchange Administration are merged into an agency to be called the Agricultural Marketing Administration.

2) The agricultural statistics division of the Agricultural Marketing Service is transferred to the Bureau of Agricultural Economics.

3) The Agricultural Adjustment Administration, the Soil Conservation Service, the Federal Crop Insurance Corp., and the sugar division are brought together into an agency to be known as the Agricultural Conservation and Adjustment Administration.

4) The bureau of animal industry, the bureau of dairy industry, the bureau of plant industry, the bureau of agricultural chemistry and engineering, the bureau of entomology and plant quarantine, the bureau of home economics, the office of experiment stations and the Beltsville research center, are consolidated into the Agricultural Research Administration.

5) All Department of Agriculture libraries are consolidated into one.

Swine Erysipelas Vaccine Licensed

On May 18, the Bureau of Animal Industry, U. S. Department of Agriculture, announced that swine erysipelas vaccine may henceforth be produced and sold by commercial laboratories. To keep history in order we quote in full and unchanged, the release of *Information for the Press* as of that date:

"Experimental use of a vaccine to protect against swine erysipelas has been so encouraging that limited licenses for its commercial production have been issued for the first time, the U. S. Department of Agriculture said today.

"This disease, which ranks second only to hog cholera as a swine disease in Europe, has been growing in importance in the United States during the last several years. It is found principally in areas with large hog populations, particularly in Nebraska, Iowa, Illinois, Missouri, and South Dakota, and in scattered sections of the rest of the country.

"In the past, swine raisers depended solely upon a serum for providing immunity from swine erysipelas. But because of its short period of effectiveness—about three weeks—the serum was helpful only if used when there were signs of an impending outbreak, and then

only on animals not yet seriously affected.

"However, because the disease is relatively new in this country, and because its symptoms vary from diamond-shaped spots on the skin to stiff, arthritic joints and death, most swine producers cannot definitely recognize it. Even veterinarians may not always tell for sure whether hogs are infected with swine erysipelas until laboratory tests are made. The disease often makes serious inroads before serum can be used. Also, erysipelas often flares up again a few weeks after serum treatment, because of the serum's short protection.

"To provide longer immunity—at least six months—the Bureau of Animal Industry in cooperation with the Nebraska Experiment Station in 1938 introduced into this country, with modification, a system of erysipelas vaccination used in Europe.

"Serum and culture vaccine for this purpose were produced by the Nebraska station, and in 1940 the experimental production of the culture vaccine was taken over by the Bureau of Animal Industry's laboratory in Lincoln. Records were kept in every herd immunized, and up to November, 1941, more than 500,000 young pigs in areas of the Middlewest where the disease is prevalent were vaccinated successfully under farm conditions.

"This year still greater numbers of swine are expected to be vaccinated, and although commercial biological firms will distribute the vaccine, they will do so under strict regulations of the Department of Agriculture. Immunization records and results will be kept of every herd this year as in the past.

"A short-coming of erysipelas vaccination is that live germs in combination with the serum must be used in immunizing, and as in virus-serum hog-cholera immunization, under some conditions there is danger of introducing the disease into a herd. Also, there is an element of danger in handling the vaccine because the disease may be contracted by human beings.

"To overcome these objections, scientists of the Department are now attempting to develop a vaccine for swine erysipelas that does not involve the use of the living organisms."

Experiments in Meat Dehydration.—The Bureau of Animal Industry, U. S. Department of Agriculture, at its Beltsville, Md. experiment station, has devised a number of new meat products in which 75 to 100 per cent of the water has been removed. When all of the water has been taken out the resulting product appears unpalatable. It is wrinkled, brown and smells bad. When the water is added, however, it becomes almost indistinguishable from the original meat. The present plan is to take out only about 75 per cent of the water, which results in a product more like the semi-dried meats which have been accepted by the American people. The British people, although re-

luctant to accept dried eggs when first received from America, it is believed will be willing to accept the dehydrated meat products. Most of the experimental work has been done with beef, but the same general principles apply to pork. Although it will be necessary to ship the new products in refrigerated bottoms, the required space will be reduced at least by one half. The experiments in dehydration of meat are continuing and it is expected they will take on extraordinary importance in the feeding of post-war Europe and Asia, a job which will devolve largely on the United States and the Argentine.

Meat Inspection Extended by Congress

Meat-packing establishments that are engaged only in intrastate business and thus would not ordinarily be eligible for federal inspection may now apply for it under the provisions of a bill recently passed by Congress and signed by the President June 10, 1942. If such establishments expect to sell substantial quantities of meat to federal agencies and if they meet requirements for sanitation and acceptable equipment they may receive federal inspection and bid on Army and Navy and Lend-Lease contracts.

Under the new legislation the Secretary of Agriculture is authorized upon application to furnish inspections and examinations such as those made in establishments engaged in interstate or foreign commerce. In these duties, the Secretary of Agriculture is represented by officials and inspectors of the Bureau of Animal Industry, the branch of the Department of Agriculture that administers the federal meat inspection regulations.

The new legislation authorizes an appropriation for the year ending June 30, 1943, and subsequent fiscal years, in such amounts as may be necessary to carry out the provisions of the act. The law provides also for the termination of the new provisions six months after the end of the present war.

Research Coördinators Appointed

Pursuant to the plan of grouping certain components of the USDA into separate units for administration, Dr. E. C. Auchter, who was named Agricultural Research Administrator, announces the appointment of Dr. Rhett Y. Winters and Mr. Henry M. Marston as "research coördinators." The former will integrate the research programs of the four regional laboratories and will assist in coördinating their work with that of the state experiment stations and bureaus of the Department. Mr. Marston will have charge of livestock and livestock products, animal diseases and regulatory activities.

"Both," says the announcement, "will be responsible for department coöperation with industry in respective fields."

BAI Transfers and Personnel News*

Edward P. Anderson from Bismarck, N. D. (tuberculosis) to Lincoln, Neb. (tuberculosis).

Marvin E. Anderson from Olympia, Wash. (tuberculosis) to Tacoma, Wash. (meat inspection).

T. M. Bayler from Chicago, Ill. (tuberculosis) to Springfield, Ill. (tuberculosis).

S. A. Berry, Jr., from Chicago, Ill. (tuberculosis) to Springfield, Ill. (tuberculosis).

Frank W. Blamey from Pueblo, Colo. (meat inspection) to Salt Lake City, Utah (meat inspection).

R. W. Boone from Chicago, Ill. (meat inspection) to Springfield, Ill. (tuberculosis).

Jacob Borach from S. St. Paul, Minn. (meat inspection) to Winona, Minn. (meat inspection).

Robt. J. W. Briggs from Chicago, Ill., (tuberculosis) to Springfield, Ill. (tuberculosis).

Carlsen, John A. from Omaha, Neb. (meat inspection) to Winona, Minn. (acting in charge meat inspection).

Lester C. Clark from Chicago, Ill. (tuberculosis) to Springfield, Ill. (tuberculosis).

E. F. Carey from Tacoma, Wash. (in charge meat inspection) to Seattle, Wash. (in charge meat inspection).

John L. Cox from Chicago, Ill. (tuberculosis) to Springfield, Ill. (tuberculosis).

Frank D. Enize from Raleigh, N. Car. (tuberculosis) to Richmond, Va. (tuberculosis).

Oliver D. Grace from Richmond, Va. (tuberculosis) to Boston, Mass. (tuberculosis).

I. N. Habecker from Chicago, Ill. (tuberculosis) to Springfield, Ill. (tuberculosis and special diseases).

A. A. Heflin from Raleigh, N. Car. (tuberculosis) to Baton Rouge, La. (tuberculosis).

M. M. Himmelstein from Sioux Falls, S. D. (meat inspection) to Baltimore, Md. (meat inspection).

C. G. Hudson from Chicago, Ill. (tuberculosis) to Springfield, Ill. (tuberculosis).

C. A. Johnston from Lewiston, Idaho (in charge meat inspection) to Tacoma, Wash. (in charge meat inspection).

Thomas K. Jones from Chicago, Ill. (tuberculosis) to Springfield, Ill. (tuberculosis).

F. O. Kieldsen from San Francisco, Calif. (in charge meat inspection) to Los Angeles, Calif. (in charge meat inspection).

Leonard Krawitz from New York City (meat inspection) to Raleigh, N. Car. (tuberculosis).

A. K. Kuttler from Chicago, Ill. (in charge meat inspection) to Springfield, Ill. (in charge tuberculosis).

*Parenthesized words indicate the line of duty.

Audrey B. Larsen from Atlanta, Ga. (tuberculosis) to Auburn, Ala. (Pathology).

Robert J. Lee from New York City (meat inspection) to Omaha, Neb. (meat inspection).

Wm. C. Logan from Chicago, Ill. (tuberculosis) to Springfield, Ill. (tuberculosis).

Vernon Lyon from Chicago, Ill. (tuberculosis) to Springfield, Ill. (tuberculosis).

Wm. R. McCall from Winona, Minn. (meat inspection) to Honolulu, Hawaii (meat inspection).

Augustus Martin from Seattle, Wash. (in charge meat inspection) to Portland, Ore. (in charge meat inspection).

Howard N. Mead from Richmond, Va. (meat inspection) to Raleigh, N. Car. (tuberculosis).

R. W. Merriman from Chicago, Ill. (tuberculosis) to Springfield, Ill. (tuberculosis).

W. W. Miller from Chicago, Ill. (Pathology) to Beltsville, Md. (AD).

Sol. Mirin from Raleigh, N. Car. (tuberculosis) to Detroit, Mich. (meat inspection).

J. M. Murphy from Chicago, Ill. (tuberculosis) to Springfield, Ill. (tuberculosis).

John L. Meyers from Winona, Minn. (in charge meat inspection) to West Fargo, N. D. (in charge meat inspection).

James D. Nolan from Spokane, Wash. (meat inspection) to Seattle, Wash. (meat inspection).

G. C. Richardson from Chicago, Ill. (tuberculosis) to Springfield, Ill. (tuberculosis).

John H. Ryan from Chicago, Ill. (tuberculosis) to Springfield, Ill. (tuberculosis).

J. E. Scatterday from Montgomery, Ala. (tuberculosis) to Jacksonville, Fla. (tuberculosis).

B. J. Stockler from Los Angeles, Calif. (in charge meat inspection) to S. St. Joseph, Mo. (in charge meat inspection).

P. P. Taylor from Portland, Ore. (in charge meat inspection) to San Francisco, Calif. (in charge meat inspection).

John A. Tele from Pierre, S. Dak. (tuberculosis) to Bismarck, N. Dak. (tuberculosis).

Gabriel Tudor from Raleigh, N. Car. (tuberculosis) to Detroit, Mich. (meat inspection).

James A. Whealy from Seattle, Wash. (meat inspection) to Lesiston, Idaho (in charge meat inspection).

J. M. Wineinger from St. Paul, Minn. (tuberculosis) to S. St. Paul, Minn. (meat inspection).

Retirements.—Emerson J. Cary, assistant veterinarian, S. St. Joseph, Mo.



Fred L. Andersen (upper right), who was in charge of circulation and mailing, was the first young man from the AVMA office to join the armed forces. He is attached now to Company B, 101st Medical Training Battalion, Camp Robinson, Ark. The picture represents a small part of Company B.

Australian Veterinary Association

At the annual meeting of the Australian Veterinary Association held at the Veterinary School, University of Sidney, New South Wales, December 5, 1941, the subjects discussed included (1) "Wartime Services of Veterinarians," (2) "Veterinary Science and Extension Services," (3) "Veterinary Air Raid Precautions," (4) "Petrol Rationing," (5) "Infectious exotic diseases," (6) "Nationalization of Veterinary Services," (7) "Evacuation of Children of British Veterinarians," and (8) "History of the Veterinary Profession in Australia."

In Australia as in Great Britain, the profession has been classified as a reserve occupation. The instigation of extension work as a war effort was to be investigated by a committee. A general outline for veterinary air-raid precautions was adopted. Apprehension was shown over gasoline rationing. Fear was expressed that the war might bring exotic diseases among the flocks and herds. Children of any British veterinarians evacuated to Australia were assured assistance.

Six months later, the program transferred unchanged to any veterinary society work of the United States would be apropos, except here the question of what to do with the veterinarians was answered by keeping them at work in their own field and by expanding that field in both military and civilian life.

AMONG THE STATES

Alabama

Personal.—Gordon C. Kendall has recently opened a small animal clinic at 1051 S. Decatur St., Montgomery, Ala.

California

California State Association.—The fifty-fifth annual meeting of the California State Association was held in San Francisco, June 23, 1942 at the Hotel Whitcomb. The following program was presented.

Edmund J. Morrissey, Stanford University School of Medicine.—Problems in Brain Surgery (illustrated).

M. J. O'Rourke, Official veterinarian, Tanforan and Bay Meadows Racecourses.—Prerace Examination for Lameness in Thoroughbreds.

K. F. Meyer, Director, Hooper Foundation for Medical Research, University of California.—War Developments in the Field of Human and Veterinary Medicine.

Dean Joel H. Hildebrand of the University of California gave the banquet address.

At the business session of the association the following officers were elected for the coming year: G. W. Closson, president; C. J. Parrshall, first vice president; W. K. Riddell, second vice president; John M. King, San Jose, third vice president; O. A. Longley, treasurer; and E. G. Le Donne, Oakland, secretary.

• • •

Dr. Rosenberger Honored by Sheep Industry.—A. C. Rosenberger, Supervising Veterinary Livestock Inspector, Division of Animal Industry, State Department of Agriculture, was honored by the California Wool Growers Association May 18, 1942, at the Annual California Ram Sale, in recognition of his 33 years service in the control of diseases of sheep and other livestock. The members of the association presented Dr. Rosenberger with a traveling bag and kit, inscribed brief case, flask, and wallet containing a \$100 War Bond. It is not often that a veterinarian is so honored by the industry especially when he still is in active duty. The sheepmen appreciate the valuable and untiring efforts rendered by Dr. Rosenberger, first in assisting in the complete eradication of sheep scab and then in the investigation and control of the many disease problems that confront the sheep industry. The honor was the following citation:

"Dear 'Doc.': For 33 years you have been going up and down the San Joaquin Valley and over the Pacheco Pass to the Salinas Valley, or up into the Mother Lode Country; perhaps even to the great Mojave Desert.

"You first went by train and stage coach or behind an old mare jogging along in a cart, through ruts and dust; then later with goggles

and duster, you honk-honked your way over treeless plains or up tortuous mountain roads, whether rain or shine, north wind or 120 in the shade, and no shade; always cheerfully and ever smiling.

"Never a word of complaint, whether you stood at the vat for six to sixteen hours; whether the sheep were on hand or you had to wait. Many is the time you've bent your back to assist us in our troubles.

"You are an inspiration, Doctor, to all of us for you do your duty; you've made the world which is yours, a better place to live in.

"We admire and salute you, sir.

"May we emulate your loyalty and devotion to duty.

"We all join in best wishes to Mrs. Rosenberger and to you."

Your friends

Among the Membership of the California Wool Growers Association.

• • •

The proposed college of veterinary medicine at the state university has been deferred until the close of the war, President Robert G. Sproul officially announced. The building can not be constructed owing to the priorities on material. Courses leading to the veterinary curriculum will, however, be continued pending fruition of the plan for the new college.

Colorado

The lead-off article in the July 4, issue of the *Journal of the American Medical Association* is entitled *Coccidial Granuloma (Coccidioidomycosis)*. Its Incidence in Man and Animals and its Diagnosis in Animals. The authors are George W. Stiles, M. D., Ph. D., and Charles W. Davis, D. V. M., pathologists of the branch pathological laboratory of the United States Bureau of Animals industry at Denver.

• • •

Sugar for Pigs.—A Colorado veterinarian signed a sworn affidavit setting forth the nutritional needs of a litter of orphan pigs in order that the owner could draw the necessary sugar from the rationing board. The board cheerfully complied in the interest of food production, marking the requisition for "ill consumers."—*From the Farm Journal*.

Idaho

State Association.—The annual summer meeting of the Idaho Veterinary Medical Association was held June 30-July 1, 1942 at Nampa. The speakers and their subjects were:

E. M. Ikard, practitioner.—Status of the Bang's Disease Program in Idaho.

M. K. Jarvis, practitioner.—Latest Known

Values of the Sulfa Compounds in Veterinary Medicine.

A. P. Schneider, director, BAI, Idaho.—Veterinary Service and the War.

George R. Fowler, Department of Veterinary Surgery, Iowa State College.—Bovine Surgery; New Ideas in Wound Treatment.

R. D. Bovey, milk sanitarian, dept. of public health, Idaho.—Program in Idaho for Better Milk Production.

Glenn C. Holm, station veterinarian, University of Idaho.—Some Problems in Reproduction; Demonstration in Artificial Insemination.

H. W. Jakeman, Boston, Mass., president, AVMA.—The Veterinary Profession and the American Veterinary Medical Association.

Illinois

Chicago Association.—On the evening of June 9, in lieu of the usual annual banquet, the CVMA, pioneer municipal Veterinary society, wound up its forty-fifth year of continuous work with a glamorous *soirée* at the famous College Inn of Hotel Sherman. Forty members and their wives celebrated the event amid luscious forage, gala rigadon and stage-craft supreme—the prelude of a bingo jamboree where a truck load of prizes were doled out to winners. Thus ended a year strewn with important monthly meetings directed by President Merrick and Secretary Anderson.

• • •

Chief Veterinarian C. E. Fidler has issued a circular giving directions on the health of cattle, hogs and sheep presented at fairs for exhibition. Cattle must be accompanied with a certificate showing that they have not been exposed to tubercular cattle within a year prior to the date of exhibition. Except for steers and calves under 5 months old, a certificate of negative test for brucellosis is required. Those vaccinated with live-culture vaccine must be so tagged. Hogs must have been vaccinated either (1) by the simultaneous methods more than 21 days prior to date of exhibition, or (2) with serum alone 10 days prior, or (3) with the crystal-violet method 21 days prior, provided that pigs vaccinated with either of the last two methods named were at least 8 weeks old when vaccinated. Sheep for exhibition must be accompanied by an official health certificate which the Department of Agriculture defines as one issued by an accredited veterinarian or a veterinarian of the U. S. Bureau of Animal Industry.

Indiana

Veterinary Preparedness Committee.—The members of the State Veterinary Preparedness Committee met at Purdue University, May 17 (quoting from the *Indianapolis Star*) "to launch a plan to dovetail the activities of farmers and

veterinarians to aid in the food-for-freedom program and to provide the necessary veterinary personnel for the armed forces."

Those present were Chas. C. Dobson, chairman; J. L. Axby, state veterinarian; President J. E. Tinder of the state association; W. A. Sullivan, of the BAI; C. R. Donham, of Purdue; and T. L. Steenerson, Wayne Alter, G. E. Botkin, Harry W. Brown, J. C. Carrico, G. A. Franz, and O. C. Shockey, members of the committee representing district associations.

Iowa

Eastern Iowa Association.—Announcement of an important meeting of the Eastern Iowa Veterinary Association is received. Besides making plans for the annual meeting in Cedar Rapids, October 13-14, 1942, the following technical program is scheduled:

W. W. Dimock, president-elect of the AVMA, Lexington, Ky.—Horse Practice Problems.

F. C. Tucker, Claypool, Indiana poultry specialist—Poultry Practice Problems.

Ben H. Peterson, professor of chemistry, Coe College, Grand Rapids—How Sulfa Drugs and Other Salts are Made.

John B. Brown, Mt. Vernon swine specialist—Swine Practice Problems.

s/ R. E. Elson, Secretary

• • •

A press release of the advisory committee, Eastern Iowa association, contains timely advice to farmers on the care of animals in summertime to enhance the food-for-freedom program. Among the recommendation are (1) watch for insanitary conditions of yards and buildings created by warm and wet weather, (3) avoid crowding in the effort to comply with the government's plea for more livestock, (3) look out for disease transmission through exchanging labor, vehicles, teams, etc., (4) control flies, (5) keep horses away from thresher belts, (6) vaccinate against swine erysipelas and cholera.

• • •

Personal.—F. L. Roach, practitioner of Preston, was seriously injured in an automobile accident June 12. Darrel White (ISC '42) is taking care of the practice.

Maine

State association.—The Maine Veterinary Medical Association, under the leadership of Pres. A. E. Coombs of Skowhegan, held its summer meeting at the hospital of A. W. Cleaves, Franklin Roads, near Ellsworth, July 8. More than 50 veterinarians and their wives attended.

The clinic and local arrangements were under the direction of A. W. and L. S. Cleaves of Bar Harbor, and E. G. Sadler, Ellsworth.

Lt. Richard Gilyard, veterinarian for the army air corps bases at Presque Isle and Houl-

ton revealed that the duties of the veterinarian at the modern American army base are not related to horses as in the first world war, but pertain to the grading and buying of foods, particularly perishable products such as meat, eggs and milk. Lt. Gilyard's present problem is to find dairies in Aroostook County which can meet army standards. He stressed the need of local meat inspection and the licensing of slaughterhouses so that the public could be assured a safe supply of local meat.

H. M. Martin of the School of Veterinary Medicine, University of Pennsylvania, discussed "Newer Developments in the Problem of Parasitism of Domestic Animals."

P. R. Baird of Waterville gave a practical discourse on the control of sterility and breeding problems in dairy herds, stressing the need of this veterinary service to maintain the increased milk production expected of Maine farmers.

The business meeting followed by a "shore" dinner at the Lobster House in Trenton, completed the day. Mrs. E. G. Sadler of Ellsworth acted as hostess for the ladies.

s/ J. F. Witter, *Secretary-Treasurer.*

Michigan

State Association.—The sixtieth annual meeting of the association was held in the Veterinary Clinic Bldg., Michigan State College, East Lansing, June 23-25, 1942. An interesting program was presented as follows:

F. D. Egan, Detroit.—A Practitioner's Experience with Hormone Products, and The Use of Vitamin C in Canine Practice.

Lt. Col. D. M. Campbell, Fort Custer.—The Work of the Army Veterinarian.

E. V. Hover, Lima, Ohio.—Swine Disease Problems.

Frank Thorp, Jr., Michigan State College.—Common Diseases of Sheep.

C. H. Hays, federal inspector in charge, and Berley Winton, laboratory director, of the U.S. Regional Poultry Laboratory.—Federal Control of Bang's Disease.

The officers for the new year are: L. H. LaFond, Detroit, president; S. G. Colby, Monroe, first vice president; C. F. Clark, East Lansing, second vice president; E. C. W. Schubel, Blissfield, third vice president; B. J. Killham, East Lansing, secretary-treasurer. H. H. Clark was elected to the board of directors, and L. H. LaFond was appointed delegate to the AVMA House of Representatives.

• • •

Personal.—Chas. Haasjes of Shelby, in speaking on poultry-health problems to the agricultural class of the Shelby High School last month, stressed particularly the importance of preventing infectious diseases. The talk, says the local press, caused several students to plan poultry projects.

Minnesota

Secretary and Executive Officer Ralph L. West of the state livestock sanitary board warned the farmers of the state that extra precautions should be taken to prevent increased losses of live stock from diseases which wartime always seems to bring. The watch for hog cholera, swine erysipelas and equine encephalitis was stressed along with the AVMA plan of providing veterinary service for the farms and army.

Missouri

The Midwest Veterinary Conference.—The second Midwest Veterinary Conference, sponsored by three associations (Kansas State, Missouri State, and the National Practitioners) was held in Kansas City June 29-30 and July 1. The Hotel President was the headquarters and the Little Theater of the Municipal Auditorium the meeting place. The attendance, including 89 ladies, was 360. Well-known specialists in the various branches of practice contributed to a program of well-selected subjects of current interest in the field of practice. The following program is self-explanatory:

W. C. Glenney, president of the Illinois State Veterinary Medical Association, Elgin, Ill.: "A Day in Practice."

James Farquharson, Professor of Veterinary Surgery, Colorado State College, Fort Collins, Colo.: "Surgical Demonstrations by Motion Pictures."

V. T. Rose, General Practitioner of Elkton, Kentucky: "Mastitis and Keratitis in Cattle."

J. H. Hughes, specialist in farm-animal nutrition, Kansas State College, Manhattan, Kans.: "Animal Nutrition."

Thos. P. Crispell, general practitioner of Parsons, Kans.: "Sheep Practice."

Geo. A. Hawthorne, general practitioner of Clarinda, Ia.: "Swine Erysipelas."

M. L. Morris, specialist in small animal nutrition, New Brunswick, N. J.: "Nutrition in Small Animals," and "Blood Chemistry."

W. P. Irwin, small animal practitioner of Tulsa, Okla.: "Time and Money Saving Methods in Small Animals practice."

F. M. Wilson, general practitioner of Mechanicsville, Iowa: "Enteric Diseases of Swine."

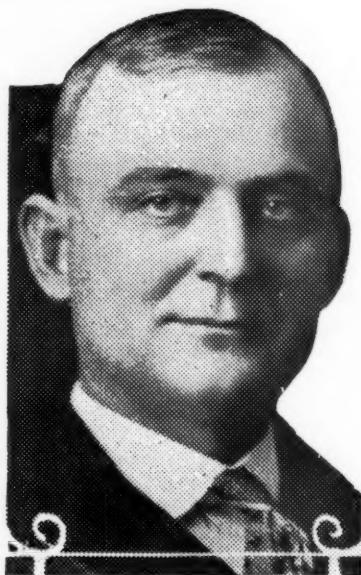
L. A. Merillat, editor of the AVMA publications, Chicago, officiated as toastmaster at the banquet.

Mrs. C. D. Folse, Kansas City, Mo., directed the ladies' entertainments.

J. L. Wells, secretary of the Missouri association was chairman of the General Committee and G. L. Dunlap of the Ashe Lockhart Laboratory, Kansas City, secretary. The other

members of this organizing and directing committee were Chas. W. Bower, S. J. Shilling, J. C. Flynn, R. F. Coffey, H. W. Young, H. W. Hearington, and Mrs. Chas. D. Folse.

The presiding officers of the six sessions (two for each of the three days) were: H. F. Dotson, president of the Kansas association; Geo. A. Hawthorne, vice-president of the National Practitioners association; H. J. Hearington, president of the Missouri association; J. W. Lumb, Kansas State College; H. W. Young, president of the National Practitioners association; and Chas. W. Bower, secretary of the Kansas Association, member-at-large of the Executive Board of the AVMA.



T. A. Sigler, new president of the National Practitioners Association

The business session of the Missouri association resulted in the election of H. W. Young as president and of J. L. Wells, to succeed himself as secretary. The National Practitioners association elected T. A. Sigler, Greencastle, Ind., as president and retained J. C. Flynn as secretary-treasurer.

Twelve exhibitors, familiar to this center of veterinary supplies, occupied booths in the spacious corridor of the Auditorium.

It was a meeting planned for and by the practitioners of the Missouri Valley region—the country's center of animal production—traditionally established as a place where veterinarians have the knack of organizing meetings of value on the problems of practice.

Montana

State Association.—Among the speakers at the annual meeting of the Montana State Veterinary Medical Association held at Great Fall,

July 10-11, 1942 were J. W. Butler, state veterinarian and chairman of the state veterinary preparedness committee, G. W. Cronen, BAI inspector-in-charge; H. W. Jakeman, Boston, Mass., president of the AVMA; A. H. Quin, editor of the Bio-Chemical Review, Des Moines, Ia.; George R. Fowler, professor of veterinary surgery, Iowa State College. — *From Helena (Mont.) Independent.*

• • •

Personal.—A few hours after arriving at the Rocky Mountain Spotted Fever Laboratory at Hamilton, Dr. Charles Armstrong, director of the Division of Infectious Diseases, National Institute of Health (U. S. Public Health Service) was stricken with a nonfatal attack of tularemia. Dr. Armstrong is known in the field of medical research for work done on botulinus, psittacosis, danguue fever, smallpox vaccination, encephalitis, and for discovering that the cotton rat is a suitable animal for studying poliomyelitis (= infantile paralysis).

New Jersey

Personal.—E. W. Smillie of Princeton, New Jersey, who was recently reappointed a member of the New Jersey State Board of Health by Governor Edison was reelected president of that body on July 14th. The work that Dr. Smillie has done well merits the recognition that has again been accorded him. He is a member of both the American and the New Jersey Veterinary Medical Associations.

s/ J. R. Porteus, Resident Secretary

New Mexico

The New Mexico Board of Veterinary Examiners has recently been reorganized. E. E. Kraus of Clovis was appointed by the Governor to fill the vacancy created by the death of Dr. Carl E. Freeman of Carrizozo. W. L. Hatcher of Cimarron was elected president, with T. I. Means continuing in the office of secretary.

New York

The American Red Star Animal Relief, organized on a national scope for the purpose of cooperating with local animal-welfare societies, has its headquarters at 135 Washington Avenue in Albany. The Relief has published a leaflet giving directions for the care of dogs and cats and birds during a wartime emergency. It stresses the importance of (1) having such animals tagged for identification, (2) preventing them from straying, and (3) providing veterinary service for the injured and sick. To be remembered is that animals are not allowed in air-raid shelters where people congregate.

• • •

New York-New Jersey Convention.—The three-day meeting of the New York and New Jersey associations July 8-10, held at the Hotel

Pennsylvania in New York City drew an attendance of 200. Meat and milk inspection for the armed forces and veterinary service for livestock to provide adequate food was discussed by Brig. Gen. R. A. Kelser, head of the Veterinary Corps. R. G. Green, Medical School, University of Minnesota and Otto Stader, Ardmore, Pa., discussed the virus of canine distemper. Sydney H. Coleman, president of the American Humane Society, spoke on the care of animals during air raids, and W. E. Buckley, trustee of Dogs for Defense, Inc., urged veterinarians to participate in selecting dogs for guard duty.

• • • • •

Fellowships in Medicine and Public Health.—The commonwealth fund of New York, a philanthropic foundation established in 1918 by the late Mrs. Stephen V. Harkness, announces that it is offering through the Pan American Sanitary Bureau fifteen fellowships for one year's study of public health subjects or postgraduate medical courses to properly qualified persons who are citizens of the other American republics. Fellowships in public health will be open to physicians, sanitary officers, technicians, public health nurses, etc. These fellows will be selected through a system of coöperation with medical and health authorities of the different countries concerned, and whenever deemed advisable they will be interviewed by traveling representatives of the Pan American Sanitary Bureau. Each fellowship will provide living allowances while the holder is in the United States, travel costs, and tuition. Knowledge of the English language will be among the requirements, and also the possession of certain specific qualifications.

The Pan American Sanitary Bureau, the international health agency of the American republics, has been for some time the recognized clearing house for medical and public health fellowships in the United States, nearly 100 Latin Americans now being in the United States under its auspices.

Application blanks giving complete information will be available through the Commonwealth Fund, 41 East 57th Street, New York; the Pan American Sanitary Bureau, Washington, D. C.; or chiefs of American Missions in Latin America.

North Carolina

State Association.—The forty-first annual meeting of the North Carolina State Veterinary Medical Association was held at Shelby at the Hotel Charles, June 25-26, 1942. The officers elected for the new year are: N. B. Tyler, Raleigh, president; C. D. Grinnels, Raleigh, first vice president; C. J. Lange, Greensboro, second vice president; J. H. Brown, Tarboro, secretary-treasurer; and A. A. Husman and J. I. Neal as directors. Thirteen new members

were received into the association. The following program was presented during the two day session.

M. R. Blackstock, practitioner, Spartanburg, S. Car.—Derangement of the Digestive Tract of the Cow.

A. O. Shaw, State College, Raleigh.—The Influence of Atmospheric Temperature on Body Temperature and Respiration Rate of Dairy Cattle.

E. J. Frick, professor of surgery and medicine, Kansas State College.—Equine Practice.

H. Calvin Rea, practitioner, Charlotte.—Some Vital Laboratory Studies in the Treatment of Dogs.

E. J. Frick, practitioner.—Dog and Cat Practice.

North Dakota

State Association.—On June 22-23, 1942 the North Dakota Veterinary Medical Association held its thirty-eighth annual meeting at the Gardner Hotel in Fargo. The speakers and their subjects were:

H. L. Walster, North Dakota Agricultural College, Fargo.—Soils and Nutrition.

Al Severson, North Dakota Agricultural College.—The Hog Man and the Veterinarian.

B. S. Pomeroy, division veterinary medicine, University Farm, St. Paul.—Poultry Diseases.

J. H. Longwell, North Dakota Agricultural College.—Care and Management of Sheep.

J. D. Ray, Omaha.—Swine Problems.

R. H. Quin, Des Moines.—Nutritional Diseases of Swine.

N. J. Miller, Eaton, Colo.—Diseases of Sheep.

T. O. Brandenburg, state veterinarian, Bismarck.—Timely Sidelights on Veterinary Medicine.

Fred C. Driver, U. S. Bureau of Animal Industry, Bismarck.—Calfhood Vaccination as an Aid in the Control and Eradication of Brucellosis.

Ohio

"Co-Ed" at Ohio State.—Come press announcements that Charlotte Turner of Cleveland can/will enter the College of Veterinary Medicine, Ohio State University. "I have worked hard in high school," Miss Turner said, "looking forward to the degree of doctor of veterinary medicine."

Oklahoma

State Association.—The twenty-seventh semi-annual meeting of the Oklahoma Veterinary Medical Association was held at Fort Reno, June 8, 1942. R. H. Gump, president, called the meeting to order. The address of welcome was given by Lt. Col. R. E. Ireland, Q.M.C., the commanding officer of Fort Reno, and the response by C. M. McElroy of Stillwater. After

short talks by Lt. Col. R. T. Seymour, depot veterinarian and Col. I. O. Gladish, V.C., Fort Sill, and a brief business session, an inspection tour was made of the depot stallions, brood mares and foals. Luncheon was served to 143 members, wives and guests at the Reno Officers' Club by the veterinary officers and their wives stationed at Fort Reno. The best horse clinic in the history of the association was held in the afternoon under the direction of the veterinary officers stationed at the post.

s/ F. Y. S. Moore, *Secretary*.

Pennsylvania

Air-raid protection and care for animals has taken form in Pittsburgh through the combined efforts of the local veterinary association, the Western Pennsylvania Kennel Club, the Animal Rescue League, Tallwaggers Institute, and Western Pennsylvania Humane Society. Providing shelter and treatment for injured animals are the objectives.

Texas

State Association.—The thirty-second annual meeting was held at the Texas Hotel, Fort Worth, January 15-16, 1942. The attendance was 125, not including 75 members of the Ladies Auxiliary. Temple was selected as the place for holding the 1943 meeting. The regular semi-annual meeting was held at the A.&M. College in May. The officers elected were, W. G. Brock, Dallas, president; Charles Koberg, San Angelo and J. W. Ward, Houston, vice-presidents; D. Pearce Leonard, secretary-treasurer, and M. B. Starnes, Dallas, corresponding secretary.

The speakers who appeared on the program and their subjects are as follows:

E. R. Frank—Bovine Surgery and Lameness in Horses.

Lt. Col. Fred Carp—Precautions and Care of Animals Before, During and After an Air Raid.

Fred P. Jaggi—Compendium on Mastitis.

C. N. Shepardson—Increasing Milk Production to Meet Army Needs.

Lt. Col. F. H. K. Reynolds—Laboratory Examination of Army Milk.

R. A. Self—Small Animal Practice as It Appears Today.

Verne A. Scott—Palominos and Quarter Horses.

Vermont

State Association.—The summer meeting of the Vermont State Veterinary Medical Association was held at Barre, July 11. A literary program and a dinner at Mario's were the main features of the event. The following papers were presented:—

N. H. Tenney, White River Junction—Lead Poisoning.

A. D. Spooner, Bradford—Tetanus, et al.

E. M. Powers, Barre—Anaplasmosis.

Lively discussions followed the reading of each paper. C. A. Jordan, of Newport was elected to the membership.

s/ G. N. Welch, *Secretary*.

Virginia

Virginia State Association.—The forty-ninth annual meeting of the association was held in Staunton at the Stonewall Jackson Hotel, July 9-10, 1942. The officers elected for the coming year are: P. J. Landis, Norfolk, president; L. E. Bowen, Lynchburg, first vice president; C. R. Pastors, Staunton, second vice president; E. P. Johnson, Blackburg, secretary; and Taylor P. Rowe, Richmond, treasurer. Following is the program of the two day meeting.

H. L. Lyon, president of the association.—The Veterinarian's Contribution to Humanity.

Adolph Eichhorn, director, Animal Disease Station, Beltsville, Md.—Important Infectious Diseases that May Enter This Country.

T. A. Sigler, Greencastle, Ind.—Equine Disease of Importance to Agriculture.

F. E. Hull, University of Kentucky, Lexington.—Sheep Diseases, and Breeding Efficiency in the Dairy Herd.

Cliff D. Carpenter, Ft. Wayne, Ind.—The Practitioner's Responsibility in the Poultry War Effort.

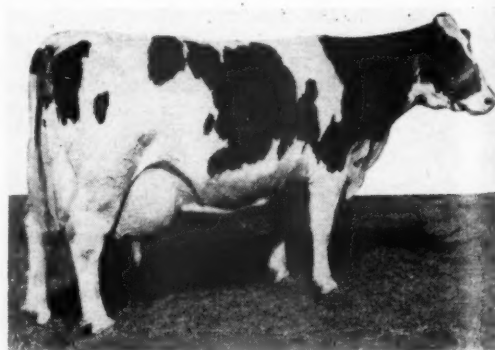
A. Appleby, Virginia Polytechnic Institute, Blacksburg.—Studies on Calcium Therapy.

W. F. Cross, Bureau of Animal Industry, Richmond.—Veterinary Homeopathic Therapeutics.

L. E. Starr, Roanoke.—Control of Bovine Mastitis.

Washington

World's Champion Cow.—When Carnation Ormsby Madcap Fayne, let down her last drop of milk at midnight May 20, 1942, the addition



The all-time champion of all cows.

showed that she had produced 41,943.4 pounds of milk containing 1,392.4 pounds of butterfat in 365 days and, therefore, had won the world's

championship for all breeds in all times by a wide margin. The former record of 38,574.6 pounds was held by her paternal sister Carnation Ormsby Butter King. The new champion, which is one of four sisters to average over 34,000 pounds of milk and 1,200 pounds of fat in a year, obviously represents a notable achievement in scientific breeding and management. Her age when the test ended was 8 years, 4 months and 5 days.

Among the details of the tests pointed out are (1) the average of 114.9 pounds a day, (2) the production of 146.5 pounds in one day, (3) the falling below the 100-pound mark but twice during the year, (4) the gain of 100 pounds in weight during the test year, and (5) the fact that she is due to freshen again Nov. 4, 1942. Owners: The Carnation Farms, Seattle.

• • •

Pacific Northwest Association—Reporting the meeting of the Pacific Northwest Veteri-

sociation, Vancouver, B. C.—The Ethics of Veterinary Practice.

George A. Ruggles, practitioner, Seattle—Leptospirosis.

J. E. McCoy, College of Veterinary Medicine, Pullman, Wash.—Blood Bank.

H. W. Jakeman, Boston, Mass., president, American Veterinary Medical Association—The Veterinary Profession and the AVMA.

W. R. Gunn, livestock commissioner, Vancouver, B.C.—Livestock Industry and Other Problems in British Columbia.

George R. Fowler, head, Department of Surgery, Iowa State College, Ames, Ia.—Bovine Surgery; New Ideas in Wound Treatment; Local Anesthesia.

J. E. Lindenmayer, Western Washington Experiment Station, Puyallup, Wash.—Diseases Affecting Turkeys.

Fred Miller, practitioner, Whitewater, Wis.—The Practitioner and Artificial Insemination;



The Red Lacquer Room in the Palmer House, Chicago, where the ladies' luncheon and bridge-breakfast will be held during the 79th annual meeting, August 24-27

nary Medical Association held in Seattle, July 6-8, Secretary M. O. Barnes of the Washington division of the triumviate (Washington, Oregon, British Columbia) signals an excellent event attended by 150 and full of interest. The program announcing the meeting as the "Quarter Century Anniversary Conference," is as follows:

S. N. Woods, president, British Columbia As-

Mammitis; Some Problems in Sterility and Obstetrics.

T. H. Keown, practitioner, Victoria, B.C.—Something About Food.

Harold Lawrence, Washington State Dept. of Health, Seattle—Venereal Disease Control Program (motion picture).

Frank Breed, Norden Laboratories, Lincoln, Neb.—Swine Diseases.

E. A. Ehmer, practitioner, Seattle—Items of Interest to the Small Animal Practitioner.

Edward A. Schmoker, practitioner, Seattle—Cartoon Lecture.

R. R. Isham, practitioner, Auburn, Wash.—The Practicing Veterinarian and Livestock Auction Sales.

Dean E. E. Wegner, Washington State College, Pullman—**Arthur E. Cox**, director of Washington State Department of Agriculture, Olympia, and **H. W. Jakeman**, Boston, Mass., president of the A.V.M.A. were the dinner speakers.

The officers of the three associations are: British Columbia—**S. N. Woods**, Vancouver president; **W. Graham Gilliam**, Vancouver, secretary. Oregon—**Stanley E. Phillips**, Medford, president; **E. W. Coon**, Forest Grove, secretary. Washington—**F. E. Smith**, Seattle, president; **M. O. Barner**, Olympia, secretary.

Wisconsin

The Southeastern Association—The Southeastern Wisconsin Veterinary Medical Association held its spring meeting at the famous Fish Shanty in Port Washington, May 21.* A fish dinner of the kind which has made "The Shanty" famous from coast to coast was the prelude of a program devoted largely to discussions on procurement and assignment of veterinarians for military and civilian duty led by Editor Merillat of the AVMA publications, to whom **J. S. Healy**, resident secretary handed 12 new members as a reward for dropping in. The ladies were entertained at the home of Dr. and Mrs. **W. R. Wastrack** in Cedarburg, where Mrs. Wastrack served a turkey dinner and carried out a delightful entertainment.

• • •

In reporting on the work of the state veterinary preparedness committee, the *Antigo Journal* says: "The needs of each farming community in the state are being surveyed by the committee to make sure that there are adequate veterinary facilities to aid farmers in keeping down livestock-disease losses. A complete roster of the veterinarians has been made by the committee, showing the availability of veterinarians for the army, government health departments, and civilian agencies. The roster is being filed in Washington authorities with whom the American Veterinary Medical Association is cooperating in this project."

• • •

United States Senator **Alexander Wiley** was the main speaker at the dinner session of the Northwestern Wisconsin Veterinary Medical Association held at Chippawa Falls, June 22.

*Lack of space in recent months has prevented earlier publication of this report.—Ed.

Belladonna.—Sixty farms totaling 175 acres in Dane county are devoted to growing belladonna for medicinal purposes. The yield ranges from 500 to 1,000 pounds to the acre and sells for about 40 cents a pound. Promoter **Thos. Beggar** is guaranteeing big returns to the growers.

• • •

Personal.—**Chester Harries** (O.S.U. '42) has been engaged as veterinarian for the East Central Breeders Association vice **Morgan Prothero**, resigned. Dr. Prothero has accepted a position as a BAI meat inspector.

COMING MEETINGS

American Veterinary Medical Association, Chicago, Ill., Palmer House, August 24-27, 1942. **J. G. Hardenbergh**, executive secretary, 600 S. Michigan Ave., Chicago, Ill.

Southern Veterinary Medical Association, Biltmore Hotel, Atlanta, Ga. Sept. 23-25, 1942. **L. A. Mosher**, P.O. Box 1533, Atlanta, secretary.

Short Course for Veterinarians. Purdue University, Lafayette, Ind. Oct. 14-16, 1942. **C. R. Donham**, head, Dept. of Veterinary Science, Purdue University.

Births

A daughter, **Judy Kayo**, was born to Dr. and Mrs. **P. E. Haland**, Charles City, Iowa, Dec. 11, 1941.

A grandson, **Walter David Schollman**, came into the family circle of Dr. and Mrs. **Joe W. Giffie**, field veterinarian of the BAI at Cedar Rapids, Ia., April 29, 1942.

DEATHS

D. Fisher (Ont. V. C. '93), 81 years old, of Hillsboro, N. Dak., died December 15, 1941. He was born in Ontario, Canada, in 1860 and came to the United States in 1800. He settled in Traill county, N. D., where he practiced until his death. Dr. Fisher was a member of the N. Dak. Veterinary Medical Association.

Amos Collins Kirby (Gr. Rapids V. C. '10), 78 years old, of Walhalla, N. Dak., died February 23, 1942. Dr. Kirby was born in Denver, Ind., in 1864. After graduation he practiced in Indiana for a short time and then moved to N. Dak. where he continued in practice until his death.

L. A. Winter (Ind. '11), Eau Claire, Mich., died March 5, 1942. He was born at Sodus, Mich., Sept. 27, 1885 and joined the Association in 1929. He is survived by his widow.

VETERINARY PREPAREDNESS

Restatement of Duties of the Various Units of the Procurement and Assignment Service

The development of the Procurement and Assignment Service program makes a reappraisal of the duties of the units seem desirable at this time.

DIRECTING BOARD

- 1) Establishment of policies and procedure for the Procurement and Assignment Service.
- 2) Maintenance of liaison with the appropriate governmental officials and agencies and with the various professional groups.

CENTRAL OFFICE

- 1) Maintenance of contacts with federal agencies relative to their needs for physicians, dentists and veterinarians, and consultations with these agencies regarding the possibilities of revision of their requests in consideration of the limited supply of professional men in these fields.
- 2) Preparation of quotas of the minimum medical, dental, and veterinarian services which should be retained for the civilian population, including private practice, hospital service, industrial service, public health service, and medical education.
- 3) Preparation of quotas for allocating to the states the requests for physicians, dentists, and veterinarians needed for war service. These quotas to be determined on the basis of the physician-population ratio in the state, the number of physicians already in service from that state, etc.
- 4) Maintenance of rosters of physicians, dentists, and veterinarians:
 1. Total in United States.
 2. Those who have registered with the Procurement and Assignment Service.
 3. These rosters to contain physician's age, qualifications, location, etc.
 4. From these rosters which will be maintained by the National Roster, names of physicians, dentists, and veterinarians with certain qualifications will be obtained from time to time.
- 5) Secure information for the various governmental agencies in regard to physicians, dentists, and veterinarians, as to:
 1. Availability for service other than in their present location.
 2. Their professional and other qualifications.
 3. Their willingness to serve in various capacities during the war emergency.

- 6) On the basis of this information, select the names of those physicians who meet the specifications of the requisitioning agency.

- 7) Coöperate with the various governmental agencies in obtaining the applications of those physicians thus elected for service.

CHICAGO OFFICE

- 1) Maintain and keep up to date the confidential information concerning all physicians, dentists, and veterinarians, with respect to character, type of practice, infringements of law, etc., which must be considered by Army, Navy, etc., in deciding whether individuals are qualified for commission.

- 2) Maintain confidential lists of the relative standing of all specialists. These lists have been developed through the facilities of the American Medical Association, the American Specialty Boards, the National Research Council, and confidential advisors representative of the various specialties. This material is to be used by the requisitioning agencies as a basis for assignment of those now on duty and those who are candidates for commission.

- 3) Assistance of a consultative and advisory nature to the Directing Board and to the various committees of the Procurement and Assignment Service. This includes the utilization of statistical data collected over a period of many years by the medical, dental, and veterinary medical associations.

CORPS AREA COMMITTEES

- 1) To supervise the work of the state committees in order that they will be reasonably uniform in the manner in which they carry out the policies of the Directing Board. This will require meetings of the Corps Area Committees with State Chairmen and visits by the Corps Area Chairman to the states within his corps area.

- 2) To act as appeal board in cases in which the individual physician, dentist, or veterinarian, his community, or his employing agency, differs with the classification given by the State Procurement and Assignment Committee.

STATE COMMITTEES

- 1) To obtain the over-all enrolment of the professions in the state. This will require the maintenance of rosters in the state offices of those who have enrolled with the Procurement and Assignment Service and those who have not. The former lists will be obtained from the central office.

2) Survey local needs for professional services in conformity with the policies laid down by the Directing Board. On the basis of these surveys determine how many physicians, dentists, or veterinarians are needed in the various communities of the states to care for the civilian needs and how many can be released for service elsewhere.

3) Determine which particular individual physicians, dentists, or veterinarians can be considered "available" for service elsewhere. In view of the changing circumstances, this will require constant reappraisal and obviously can be done only locally.

4) Pass upon the availability, character and professional qualifications of individual physicians who are being considered for appointment for service elsewhere, e. g., for commissions in the Army, Navy, etc.

5) Coöperate with the state offices of the Selective Service System in determining whether physicians, dentists, and veterinarians who are subject to classification by Selective Service are essential in their local communities.

6) Maintenance of lists to be transmitted from the central office of those who have expressed their preference for service in industrial practice, civil practice in other communities, state and local health departments and institutions, and to act as liaison between these individuals and the industrial organizations, civil practitioners, health departments and institutions, desiring the services of these individuals in a temporary capacity for the duration of the war.

7) Keeping the Directing Board informed of conditions in the state, and bringing to the attention of it matters which may involve general policies.

8) Periodical (weekly) reports to the central office of the names and addresses of those commissioned from the state with information as to which of these have been serving as internes or residents.

DISTRICT OR COUNTY COMMITTEES

1) To provide information, assistance, and advice to the state committees in carrying out their functions. Local committees have no authority to make final decisions as to whether positions or individuals are essential or non-essential.

By Order of the Directing Board:

(Signed) SAM F. SEELEY, M. D.,
Executive Officer.

June 23, 1942.

THE ADDRESS OF PROCUREMENT
AND ASSIGNMENT SERVICE HAS
BEEN CHANGED TO 1006 U STREET,
N.W., WASHINGTON, D.C.

Nearly 90 Per Cent Return of Veterinary Enrollment and Questionnaire Forms Reported

Nearly 11,200 veterinarians have completed and filed Veterinary Enrollment and Questionnaire Forms for the Procurement and Assignment Service according to preliminary figures just received from the Washington office of the National Roster of Scientific and Specialized Personnel. The forms were mailed April 15, 1942 to a list of about 13,000 veterinarians in the United States and its possessions.

This is a return of 86 per cent, an excellent figure comparing very favorably with returns from similar questionnaires mailed to members of the medical and dental professions at about the same time. While the veterinary record is good, the returns are still incomplete. The National Roster, the Procurement and Assignment Service, the American Veterinary Medical Association and its constituent state societies all want the survey to be as nearly 100 per cent complete as possible.

A special mailing will be made in the near future by the National Roster office to the approximately 1,800 veterinarians who have not returned their enrollment and questionnaire forms. In the meantime, we urge every veterinarian who has not already done so to fill in the blanks and mail them in the franked envelope provided. If you did not receive a set of the forms, drop a post card to the AVMA Office, 600 S. Michigan Ave., Chicago; they will come to you by return mail.

Loans Provided for Students Under Accelerated Curriculums

The loan fund of \$5,000,000 voted by Congress to help college students speed up their training for technical and professional jobs will be available soon, Paul V. McNutt, War Manpower Commission Chairman, announced on July 17.

Monthly loans totalling not more than \$500 a year, at 2½ per cent interest annually and cancelled if the student is drafted during training, will be made directly to students by colleges or universities, and by public or college-connected agencies, Mr. McNutt said. Federal funds will be allocated to the loaning institutions by the U. S. Office of Education on the submission of estimates of the amount of money for such loans.

Bulletins announcing the program have been sent to all colleges and universities in the United States by the Office of Education.

This financial assistance will permit students to pursue intensive programs of study which will prepare them as soon as possible to meet growing needs for technicians. Loans will be

made to students in engineering, physics, chemistry, medicine, dentistry, pharmacy and veterinary medicine who are within two years of completing their work. The program is an outgrowth of recommendations by the Office of Education Wartime Commission which conducted studies of the need of accelerated programs in colleges.

Plans for administration of the student loan fund are being developed by Dr. Fred J. Kelly, Chief, Division of Higher Education, Office of Education. They will be submitted by John W. Studebaker, U. S. Commissioner of Education, to Mr. McNutt, for approval.

Essential points of the student war loan program as developed by Commissioner Studebaker are:

Where to apply.—Loans are made to students directly by colleges or universities or public or college-connected agencies. Federal funds are paid the colleges upon estimates submitted as to the amounts necessary for loan.

Special conditions.—Loans are available only to students who are registered in accelerated programs in degree-granting colleges and universities and whose technical or professional education can be completed within two years, in one of the following fields:

Fields of work.—Engineering, Physics, Chemistry, Medicine (including Veterinary), Dentistry, and Pharmacy.

Written Agreement.—The student agrees in writing (1) to participate, until otherwise directed by the chairman of the War Manpower Commission, in accelerated programs of study in any of the authorized fields; and (2) to engage for the duration of the wars in which the United States is now engaged, in such employment or service as may be assigned by officers or agencies designated by the chairman of the War Manpower Commission.

Scholarship.—Students must attain and continue to maintain satisfactory standards of scholarship.

Need.—Students must be in need of assistance.

Maximum Loans.—Loans shall be made in amounts not exceeding tuition and fees plus \$25 per month, and not exceeding a total of \$500 to any one student during any 12-month period.

Security.—Loans are to be evidenced by notes executed by student borrowers payable to the Treasurer of the United States.

Interest rate.—The rate of interest is 2½ per cent per annum.

Repayments.—Repayments of loans are to be made through the colleges, universities, or other agencies negotiating the loans, to be covered into the Treasury as miscellaneous receipts.

Cancellation.—The indebtedness of a student shall be cancelled: (1) If before completing

his course he is ordered into military service during the present wars under the Selective Training and Service Act of 1940, as amended; or (2) if he suffers total and permanent disability; or (3) in case of death.

Status of Students from Cobelligerent and/or Neutral Countries

The following memorandum from the national headquarters of the Selective Service System has been sent out to various components of the Procurement and Assignment Service by Sam F. Seely, executive officer:

Graduate students from either cobelligerent or neutral countries who enter the United States on students' visas, and who expect to return to their native lands upon completion of their studies, should arrange for a determination of their status by the Selective Service local board in the community where they are temporarily residing. The student should submit an "Alien's Application for Determination of Residence" (Form 302) together with an "Alien's Personal History and Statement" (Form 304) to the local board within three months after the date of his entry into this country. If the local board finds that the applicant is not residing in the United States within the meaning of the Selective Training and Service Act of 1940, as amended, an "Alien's Certificate of Nonresidence" (Form 303) will be issued to him.

The issuance of such certificates of nonresidence will indicate that the applicant is not intending to establish residence in the United States, but intends to leave upon the completion of a given course of study. The period of validity of the certificate of nonresidence will vary according to the needs of the individual case.

One of the hazards of air-raid bombing is the releasing of dangerous wild animals from the zoological parks: poisonous snakes, tigers, lions, etc.

In 1933, Floyd Gibbons, war correspondent *par excellence*, said "we may some day be carrying water for the Jap's," whereupon, someone hollered, "Whoinel is Gibbons?"

The answer to why we are short of rubber is exactly the same as why Guam was not fortified and merchant ships not provided with "shootin' irons," so that the sailors could at least take a pot shot at U-boats. Proposals to build up a stock of rubber long after the war broke out were either turned down or not acted upon. The isolationists were still in the saddle. But grumbling about the past won't put tires on automobiles. Just save what you have.

Appointments to the War Manpower Commission

Chairman Paul V. McNutt announced on July 17 the following appointments to the War Manpower Commission, completing most of the national organization:

Edward C. Elliott, president of Purdue University, to be chief of the Professional and Technical Employment and Training Division. Under his direction will be the engineering, scientific and management defense training program conducted in more than 200 colleges and universities through the U. S. Office of Education. Also under him will be the National Roster of Scientific and Specialized Personnel, charged with recruiting professional and technical workers for the armed services, war industries, and governmental war activities, and the Office of Procurement and Assignment, charged with securing physicians, dentists and veterinarians for the armed forces and for war communities. Dr. Elliott is on leave from his post as president of Purdue University, Lafayette, Indiana.

Lieut. Colonel Sam Seeley, Medical Corps, United States Army, to be chief, Office of Procurement and Assignment Service.

Dr. Leonard Carmichael, National Roster, Scientific and Specialized Personnel.—Dr. Carmichael is president of Tufts College, Medford, Mass., which has been outstanding in medical education. He organized the Roster in 1940 and has directed it since.

John J. Corson, chief, Industrial and Agricultural Employment Division.—Mr. Corson, who will continue as director of the Bureau of Employment Security of the Social Security Board, will be responsible for coordinating the war manpower functions of the U. S. Employment Service, the department of Agriculture, Work Projects Administration's employment services, the Railroad Employment Service, and the Office of Defense Transportation Employment Service. Mr. Corson is 36, a native of Washington, D. C., and has a background of newspaper work, economics and government service.

Lieutenant Colonel Clinton Roy Dickerson, United States Army, chief, Military Division.—Lt. Col. Dickerson is assistant to Major General Lewis B. Hershey, director of the Selective Service System.

Dr. Elliott, Mr. Corson, and Lt. Col. Dickerson are responsible to Brigadier General Frank J. McSherry, director of operations, War Manpower Commission.

Serving under Arthur J. Altmeyer, Executive Director of the Commission, will be the following:

Dr. William Haber, chief, Planning and Progress Reports Division.—Dr. Haber, on leave from the University of Michigan, has been on the staff of the director of the budget and is

on detail from the Bureau of the Budget to direct the planning activities of the War Manpower Commission.

Frederick F. Stephan, chief, Statistical Analysis and Coordination Service. Mr. Stephan is president of the American Statistical Association.

Robert C. Weaver, chief, Negro Manpower Service.—Dr. Weaver was formerly Negro affairs adviser to the Interior Department and the USHA and has headed the negro employment and training branch of the Labor Division of the OPM and WPB for the last two years.

Will W. Alexander, chief, Minority Groups Service.—Dr. Alexander, former Farm Security Administrator, directed a minority group program in the WPB's Labor Division, and is on detail from the Julius Rosenwald Fund, of which he is vice-president. He has served many years as executive director of the Commission on Interracial Cooperation.

Harold Dotterer, chief, Administrative Services.—Mr. Dotterer, chief clerk of the Federal Security Agency, has been detailed to the Manpower Commission.

Chairman McNutt also announced appointment of Raymond Rubicam, president of the advertising firm of Young & Rubicam, New York City, as a special assistant. Mr. Rubicam is serving without compensation.

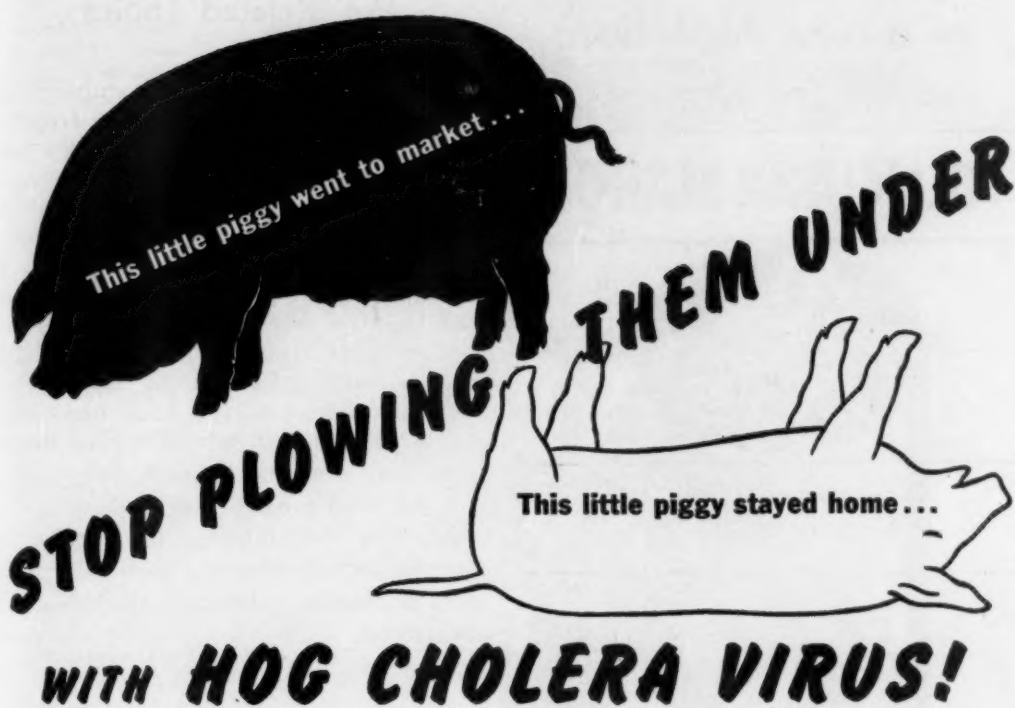
Previously announced were appointments of Fowler V. Harper as deputy chairman and Bernard C. Gavit as general counsel to the Commission.

Shortage of Physicians Acute

At the annual session of the American Medical Association in Atlantic City, Director Paul V. McNutt of the War Manpower Commissions, warned physicians bluntly that unless voluntary recruitment progresses more rapidly "some more rigorous form of selective service must be resorted to." The situation is, the Director added, that the medical profession is permitted to diagnose its own case, and the case is urgent. More than 20,000 additional physicians will be needed by the armed forces before the end of the year.

According to a good authority on writing no really good book or article was ever dictated. Worth while reading material is *written* by the author, not *dictated* to a stenographer. The reason is best known to those who write.

Keep Them Flying
Buy War Bonds and Stamps



Advantages of
CUTTER B-T-V
*over old
 serum-virus method*

- 1** Eliminates use of living virus.
- 2** Pigs remain on full feed; no vaccination stunting. Usually reach market weeks earlier.
- 3** No systemic reactions.
- 4** Vaccination is economical.

Considering the value of pork today, considering the country's need—can you justify continuation of the old, wasteful serum-virus method of inoculation? No question but what those which survive are immune to hog cholera, but too many fail to survive and all are needlessly set back for weeks.

Have you turned to Cutter B. T. V.?

If not, just what are you waiting for? Nearly a million pigs have been successfully immunized with B. T. V. and progressive veterinarians will immunize over a million more this year. Is any further proof needed of its immunizing ability?

Do you want proof that B. T. V. stops losses of pigs that "just can't stand up under virus"... stops losses of pigs suffering from secondary infections which flare up when virus is injected... stops losses due to feeding set-backs which invariably occur after serum-virus? Then just investigate any farm near you where B. T. V. is being used. Why not overcome Old Man Inertia and make such an investigation *today*.

CUTTER Laboratories • Berkeley, Calif.

111 N. Canal Street, Chicago • 138 W. 53rd Street, New York

—a new high note
in the treatment of

FOLLICULAR MANGE



IT WORKS BETTER

Relieves itching quickly, and promotes vigorous growth of hair.

IT'S MUCH SAFER

Will not injure nor irritate eyes; nontoxic and nonstaining.

IT'S INEXPENSIVE

Economical, since a little goes a long way without waste.

Goodwinol is an unguent containing rotenone and orthophenylphenol in a cholesterol base—greaseless, odorless, and easy to apply. In controlled tests, there were no failures in a series of 443 chronic and acute cases treated with Goodwinol.

GOODWINOL PRODUCTS CORP., 90 PRINCE ST., N. Y.

GOODWINOL

AVAILABLE: From your local veterinary supply house, or from the manufacturer—in 1 oz. tubes, or 1, 2, 5, or 10 lb. tins.

An' Related Topics

The S. F. S. of '42

(S)hips, (F)ood and (S)hortage is the *Scylla and Charybdis* of this troubled world. Mostly, they concern the food supply of hungry people, and there can be no remission 'til the warring nations lay down their arms and go back to peaceful pursuits.

Those who, two years ago, predicted that food would win the war spoke wisely but they spoke to ears that hear not. Today, with a large proportion of the world's population rationed for food and other necessities, the first pair of cranial nerves is working overtime to catch every vibration on that subject that breezes along. Meanwhile, maintaining the health of domestic animals, the function of the veterinary profession, is beginning to be vaguely understood.

Specialize on Geriatrics

Says a medical journal (in effect): "The sulfa drugs are taking the practice of medicine and surgery for a ride. Chemotherapy is upsetting the apple cart. Acute bacterial infections, once long drawn out affairs, are now cured too quickly to give the doctor a break. Besides, diseases are getting milder and the incidence of illness is decreasing. Doctor bills are getting painfully low." So why not specialize on geriatrics—old age will not desert you, nor will it ever desert the undertaker.

And Another Thing

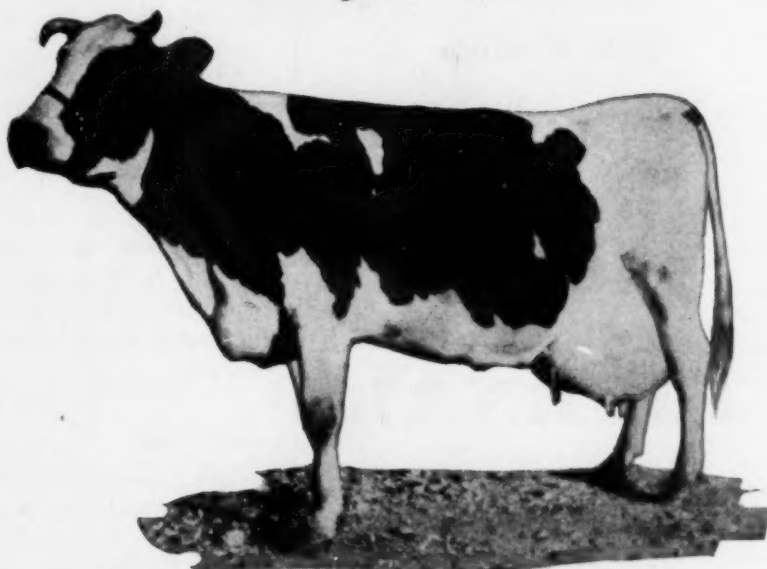
It may not do a great amount of harm to take army and navy matters out of the hands of the generals and admirals at luncheon, but God forbid that amateur strategists be taken seriously. And besides, it is not becoming to professional men who know how difficult it is to master their own *metier*, to be telling other professional men how to do theirs. Easy-chair, cracker-box, strategy is quackery.

Mineral D-Ficient
soil can't make
Mineral E-Ficient
crops.

Viamineral compound

*Tell your clients
to "Feed the farm
if they want the
farm to feed them."
A good plan.*

*Herdsmen claim
"boarder" cows
may be made
profit makers with
correct feeding.*



Foster Mother of the Human Race. She, and her sisters, produce 14,500,000,000 gallons of whole milk annually in the United States alone.

*Extra Calcium,
Phosphorus, Iodine
and Vitamins may
lengthen the lacta-
tion period and
help build stronger
calves.*

VIAMINERAL COMPOUND has been recommended and dispensed for a quarter century by members of the Veterinary Profession where there is a need to supply Calcium, Phosphorus, Iodine and Vitamins that may be lacking (in sufficient quantities) in home grown feeds and some mill mixed rations. Has proved an aid in

CONTROLLING — PREVENTING — CORRECTING
those deficiencies that may be due to lack of SUFFICIENT CALCIUM, PHOSPHORUS, IODINE AND VITAMINS IN THE RATIONS.

May we conscientiously suggest that VIAMINERAL be made a definite part of the daily rations of dairy cows, beef cattle, horses and sheep—not alone as a corrector, but as a preventive of those conditions where CALCIUM, PHOSPHORUS, IODINE AND VITAMINS MAY BE INDICATED.

*Feeding VIAMIN-
ERAL while dairy
herd is on pasture
is credited with
building up cal-
cium and phos-
phorus reserve for
winter months.*

VIAMINERAL should be used as a supplemental feed—to bolster up the calcium, phosphorus, iodine and vitamin content. To guard your interests this product is available only through the Veterinary Profession.

The new 7th edition of "VPC Feed Formulas for Livestock and Poultry" is ready for mailing. 32 pages; 30 pictures; 40 feed formulas. Send postcard for FREE copies for yourself and the leading livestock and poultry producers in your territory.

VITAMINERAL PRODUCTS CO.

1522 No. Adams

Peoria, Ill.

The AVMA
Will Pay
25 Cents
Plus Postage
for the following

**BACK
ISSUES
OF THE
JOURNAL**

April 1941
August 1941
September 1941
January 1942
February 1942
March 1942

Must be in good condition

**AMERICAN VETERINARY MEDICAL
ASSOCIATION, 600 S. Michigan Ave.,
CHICAGO**

An' Related Topics

Lackadaisical or Sciolistic

Orthography?

When a fusillade of misspelling hits a short paragraph the damage is more apparent than if scattered through a long article. The following example evokes the thought:

In addition to the *peroneal pruritits*, the teeth were *carous*. The *biologics* consisting of an *innoculation* for distemper and a dose of *pituitin* to stimulate the uterus may have been the *causitive* factors. To correct the intense itching at the root of the tail, a dose of Epsom salts was given. (*italics ours.*)

The above is quoted as an example not only of a high batting average for misspelling but also of words easily and often murdered more through indifference than sciolism.

Aluminum

The scarcity of aluminum is due to the difficulty and cost of extraction. Although one of the most abundant metals of the earth, it does not exist in the pure state. When extracted from bauxite, the supply of which is limited, the cost of extraction is \$30 to \$40 a ton. Chemists of Columbia University have developed a process of extraction from common clay at the cost of \$30 a ton.

Aluminum, because of its light weight, has become quite indispensable for making retention apparatus in the treatment of leg fractures in small animals. The acetate in solution (Borow's lotion) is employed as a local application to inflammatory swellings.

Some Old Farm Papers

The *Country Gentleman* claims to have been born at Philadelphia in 1831 under the names of the *Cultivator* and the *Genesee*

**IN CANKER
OTORRHEA
EAR MITES**

VETERINARY

Auralgan

Veterinary Division

THE DOHO CHEMICAL CORPORATION

NEW YORK - MONTREAL - LONDON



OF NATIONAL INTEREST

Protection of the hog crop is of vital interest to the livestock owner as a means of livelihood. It is essential to him that disease be prevented or successfully treated.

To the balance of the nation's population, the hog crop represents an important source of food supply. They demand as imperatively as the farmer that ample and assured protection be afforded every pig.

NATIONAL offers the GRADUATE
VETERINARIAN a high quality
and uniform product, which
combination guarantees the
desired conservation.

THE NATIONAL LABORATORIES CORPORATION
KANSAS CITY, KANSAS

Why Friskies is a complete dog food

19 essential ingredients

Friskies is a complete, scientifically balanced food for dogs. It contains meat in 3 forms: meat meal, liver meal, meat scraps. Also specially prepared cereals, dried skimmed milk and minerals so necessary for strong teeth, sturdy bones, a healthy coat.



Necessary vitamins in ample amounts

Friskies' 19 essential ingredients include sardine oil, irradiated yeast and wheat germ that give dogs adequate amounts of Vitamins A, B₁, D, E, G(B₂) and K. Because Friskies is a balanced food it helps correct skin ailments caused by faulty diet.

Dogs love Friskies

More than ten years of actual "taste-testing" with many breeds in the Friskies laboratory kennels at the famous Carnation Farm proves that dogs like Friskies. In its compressed cube form Friskies is easy to digest.

Friskies is economical

It costs less to feed Friskies because it's 90% solid food—only 10% moisture. There's no waste, no refrigeration problem when you feed Friskies—the *only* food a dog needs.

BUY FRISKIES AT YOUR GROCER'S!

FREE BOOK!

32 pages of vital information about the feeding and care of your dog. Write: Friskies, Department 2, P.O. Box 71, Oconomowoc, Wis.



An' Related Topics

Farmer. The *Prairie Farmer* came out as such in 1841 and is conceded to be the oldest of the farm periodicals published under the original name. But, the *Breeder's Gazette* is the senior of all farm papers devoted exclusively to livestock. It was started in Sigourney, Iowa, in 1869 under the name of *Western Stock Journal*. In 1870, it absorbed the newly born *National Livestock Journal*, and moved to Chicago. In 1881, the name was changed to *Breeder's Gazette*.

The Army Mule

The Army has 7,000 mules and reports indicate that 15,000 more are about to be procured out of the 4,500,000 mules still used by American farmers. The mule is an essential military animal for land operations on whatever terrain troops have to move: desert, mud, jungle, forest, mountain passes, where nothing else will answer the purpose. It is a wise and sure-footed animal where other means of transport fails, and rates as one of the most willing animals working in difficult places. The Army pays from \$20 to \$25 more for mules per head than for horses.

Free Press

During this war period, any newspaper which continues to put personal philosophies before the interests of the whole nation is demonstrating an unpatriotic streak which can deal a severe blow to people's respect for the free press. The American people are interested in just one thing—they want to win this war. If you [the editors] show that you can accept the responsibilities and forego some of your privileges in order to speed that job along, well and good; if you can't, the wrath of the people is likely to descend on you with a heat that will consume both your privileges and your responsibilities.—Don Robinson in *The American Press*, May 1942, page 19.



Veterinarians are pleased with the oxytocic reliability of Pitocin.* It acts quickly to prevent or minimize hemorrhage after labor and to hasten the expulsion of the placenta.

Pitocin(alpha-hypophamine) contains the carefully standardized

oxytocic principle of the pituitary gland with almost none of its pressor principle. Thus, it effectively stimulates the power and frequency of uterine contractions without raising the animal's blood pressure. Systemic reactions rarely follow its use.

*Trade Mark Reg. U. S. Pat. Off.

Pitocin

Made only by Parke, Davis & Company

PARKE, DAVIS & COMPANY

DETROIT, MICHIGAN

WALKERVILLE, ONTARIO

For Skin Irritations
Where a Cooling Lotion
Is Desired
Try

SKIN EASE

A Pleasantly Scented, Non-oily Emulsion, Containing Menthol, Salicylic Acid and Resorcin in a Glycerine Substitute Base

J. F. DE VINE LABORATORIES, INC.
 Goshen New York

An' Related Topics

Point d'Appui (=Prop)

Not long ago, (1928), the Minister of Agriculture of France, addressing a veterinary conference, portrayed *la service vétérinaire* founded in that country in the eighteenth century, as a *point d'appui* of the modern nation and emphasized the ever-existing danger of kicking out the prop by uninformed populations. "Developing, fortifying, improving the veterinary service preconized by Louis XV and set in motion by Claude Bourgelat at Lyon in 1761, is an underestimated, patriotic duty," he added.

In these days of war, while the country is being drawn upon to feed large populations beyond its own bournes, attempts to supplant with quackery the scientific veterinary medicine that has propped up the food-making machinery so well in the past, is little less than a fifth-column stab in the nation's back and a threat to the very freedom veterinary quackery has enjoyed.

DOCTOR!

YOU CAN
RECOMMEND

VITALITY

DOG FOODS

WITH CONFIDENCE

Nothing has been left undone to make VITALITY Dog Foods unmatchable in quality of manufacture and unbeatable in actual feeding value of weanlings to mature animals. You can count on every bag to give dogs:

Ample, easily digested proteins.	Palatability.
Dextrinized starches that supply large amounts of energy.	Completely mineralized.
Enzymes that aid digestion.	Uniformity.
Vitamin fortification.	Variety.
Biological value.	Economy.
	Nutritional dependability.

And combining all these into one word "confidence"—the surety of the money-back guarantee behind every bag of VITALITY DOG FOODS.

For more complete information write

VITALITY MILLS, INC.

Board of Trade
CHICAGO, ILLINOIS

A DRY DOG FOOD YOU CAN

PURINA



RECOMMEND WITH CONFIDENCE

DOG CHOW

TODAY when many dog owners are going to change to a dry type dog food, they're asking, "Which dry dog food shall I choose for my dog?" Purina Dog Chow is a time-tested and proven answer to this question.

PROVED IN PEACETIME...IT MEETS A WARTIME NEED. Purina Dog Chow is not a wartime substitute—it is a dry food developed by more than 15 years of laboratory and kennel research to find out which foods are best for dogs and which foods dogs like best!



15 YEARS OF FEEDING RESEARCH at the Purina Kennels stand back of Purina Dog Chow. At these kennels more than 1,600 dogs have been whelped, have lived, have eaten many different foods to determine just what ration is best for dogs.



12 CONSECUTIVE GENERATIONS of happy, healthy dogs have been raised exclusively on Purina Dog Chow at the Purina Kennels. This is proof of Dog Chow's ability to support reproduction from generation to generation—to maintain top vigor and condition.



SALLY and her 99 PUPS whelped in 7 years on a straight ration of Dog Chow at the Purina Kennels, again shows that Dog Chow has every food element needed for vigorous health.



SALLY II, daughter of Sally, is proving her mother's record on Dog Chow is no accident by beating it so far. In 9 litters Sally II has whelped 85 pups—14 ahead of her famous mother for the same number of litters!

For information on Dog Chow, write to

St. Louis

PURINA MILLS

Missouri

Graslets

**GRASS
VITAMINS
FOR DOG HEALTH**



**New Package
New Low Price**
NEW NATION-WIDE CONVENIENT
DISTRIBUTION BY THE
QUAKER OATS COMPANY
**KEN-L-PRODUCTS
DIVISION**
Rockford, Illinois



**Economical way to
BETTER NUTRITION
SOUNDER HEALTH**

Proved by actual use for more than two years under scientific supervision, Graslets is now an established and preferred vitamin source and nutritional factor at many leading kennels and veterinary hospitals. This basic grass vitamin ration fed in conjunction with the dog's regular diet supplies all the essential vitamins, easily fed, palatable and extremely low in cost ($\frac{1}{2}$ ¢ to 1¢ per day per dog — 20 to 40 lb. dogs).

Graslets is not a medicine but rather a basic grass vitamin ration used, not only to bring vitamin deficient dogs back to health, but also as health insurance for normal dogs. Graslets will aid in the promotion of lively good health, bright-eyed alertness and playfulness, regular habits, healthy skin, sleek luxurious coat. And now Graslets cost much less than formerly—order it in the convenient new package.

**KEN-L-PRODUCTS DIVISION, Quaker Oats Company,
801 PEOPLES AVENUE, ROCKFORD, ILLINOIS**
Please send Graslets literature and details of
money saving introductory offer.
NAME
ADDRESS
CITY STATE

An' Related Topics

What Is a Convention, a Congress, a Meeting?

The unborn AVMA held a *convention* in New York City June 9, 1863, when a group of veterinarians for the eastern seaboard were summoned for the stated purpose of studying what might be done to improve the grave animal-disease situation brought about by a devastating war and absence of systematic effort. Incidentally, the gathering founded the society now known as the AVMA. That was a *convention* in fact. In 1893, that society held a *congress* in Chicago on the occasion of the World's Columbian Exposition carried out to celebrate the landing of *Christophori Columbi genuensis* at San Salvador in 1492. Here, as one of the many other congresses held in Chicago, the national society invited the veterinarians of foreign countries to meet with them under the official sanction of the Exposition. All the rest of the annual and semiannual events were just *meetings* or sessions (101 of them) convened to carry out a constitutional program.

Indict the Cheese Men

Although the makers and distributors of cheese claim to have been following the pep-up program of the United States Department of Agriculture and the Federal Trade Commission, they have nevertheless been indicted by the Federal Grand Jury, Chicago, for conspiracy to fix prices. The indictment involves 101 dealers, processors and distributors. Among them are America's most prominent figures in the "food for freedom" menu mapped out by the government itself.

HASCO EAR TAGS

136

Cattle, Sheep and Hogs
Used by U. S. Dept. of Agriculture, State Dept's, prominent breeders. Pillable, rust-resistant steel. Lowest prices. Send for circular.

FREE SAMPLE

NATIONAL BAND & TAG CO., Dept. 6-400, Newport, Ky.

An Important Advance

in

Veterinary Medicine

TYROTHRICIN

Emulsion

•

Chandler

Veterinary

for

BOVINE MASTITIS

CHANDLER LABORATORIES INCORPORATED
Philadelphia **Pennsylvania**

UNIVERSITY OF PENNSYLVANIA

School of Veterinary Medicine

PHILADELPHIA

•

Offers a complete course in veterinary medicine extending over four sessions, each beginning the fourth Monday in September and ending the second Wednesday in June. Clinics and equipment unexcelled.

Graduate Courses in Pathology and Bacteriology (including immunology) extending through one session.

For Catalogue and further information, address

GEORGE ALEXANDER DICK,
Dean, Veterinary Faculty

An' Related Topics

Rationing

The main thing to remember about rationing is that it does not necessarily mean a significant food shortage but a preventive thereof, plus an attempt to insure a more equitable distribution, with the object of preventing widespread malnutrition while others wallow in plenty. Another object is laying up surpluses for nonexisting but probable emergencies. At worst, judging from authentic information from unoccupied France, there will always be a large variety of food not rationed at all and sold under a price ceiling that puts everyone on an equal footing.

The Worst Jokes of the Month

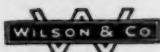
Visitor.—At what joint did you have your dog's leg amputated?

Hostess.—I will have you know that my veterinarian doesn't run a joint.

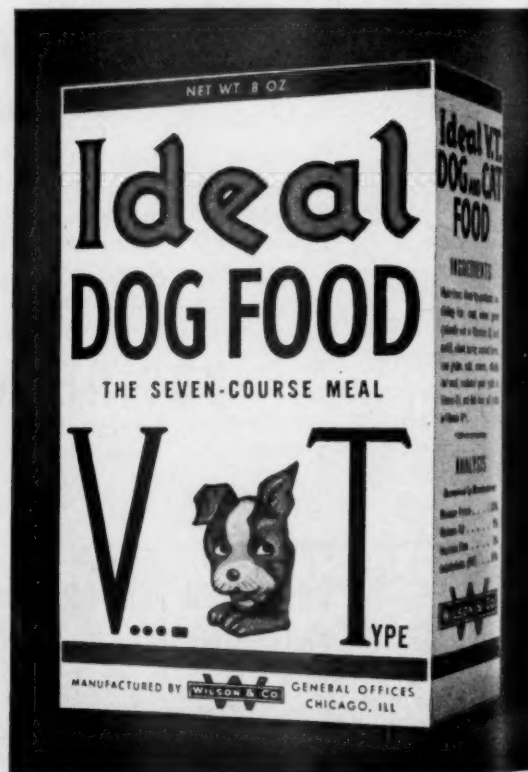
Presenting THE FIRST V...-Type MEAT BASE DOG FOOD

**Made by a MEAT PACKER with
years of Dog Food experience**

This new "V-T" (victory-type) Ideal is a product of 3 years' work by Wilson & Co.'s dog food experts. Contains the same amount of MEAT as Ideal in cans, with other proved ingredients that supply minerals, vitamins and carbohydrates. Merely add liquid (water, milk or broth) to make a complete, satisfying, adequate ration. Requires no refrigeration. Wilson & Co. (Dog Food Division), Union Stock Yards, Chicago.



MEAT PACKERS



AVMA AUTOMOBILE EMBLEM

**It's the handsomest emblem ever
made available to AVMA members.
Brilliantly designed in red, gold
and white.**

\$1.50
(POSTPAID)

Send orders to:

**AMERICAN VETERINARY
MEDICAL ASSOCIATION**

**600 S. Michigan Ave.
Chicago**



**ATTACHES TO THE
LICENSE PLATE OR
LICENSE-PLATE HOLDER**

CLASSIFIED ADVERTISEMENTS

Twenty-five words or less, \$2.50; 8 cents for each additional word. Replies sent in care of the JOURNAL, 25 cents extra.

Positions Wanted

Position as assistant to a veterinarian in small animal clinic or hospital. Years of experience. Best of references. Address "DF", c/o Journal of the AVMA.

Veterinarian as associate in small and large animal practice wanted. Situated in metropolitan New Jersey. Active work. Write all details in first letter. Address "KL", c/o Journal of the AVMA.

For Sale

Instruments and drugs. Also office and garage for rent of my late husband. Address Mrs. R. C. Hurlburt, Boonville, N. Y.

For sale or lease—excellent small animal practice in New York City. Completely equipped small animal hospital. Reason for selling early call to army expected. Address "SM", c/o Journal of the AVMA.

PRACTICES, LOCATIONS and partnerships furnished and sold—all states. F. V. Knlest, 1537 S. 29th St., Omaha, Neb.

Books and Magazines

WORLD MAP OF DOGS—Unique, Educational; 19"x24"; \$1.00 each (3 for \$2). Also Chart of All American Breeds, same size, same price. A complete American work on dogs, *Judy's Dog Encyclopedia*, with supplements, \$5. Judy Publishing Co., 3323 Michigan Blvd., Chicago, Ill.

An' Related Topics

It's Organize or Perish

Loose majorities eat obediently out of the hands of organized minorities in this modern world.

THEY DO SLIP IN

- 1) "I found no *pathology*."
- 2) "The pig was *autopsied*."
- 3) "The bird was *leucotic*."
- 4) "We *posted* two of the pigs."
- 5) "The pup had been *wormed*."

Prophet and Loss

D. V. M.—(On the telephone). I say, John, when do you think you'll be able to pay that bill?

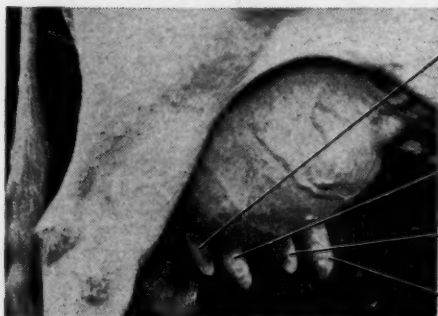
John, the client.—Gee, Doc, the way things are, I ain't no prophet.

D. V. M.—I'll say you're no profit, good bye.

Four Reasons why you should try ARMOUR'S MASTOL

(Iodized Hydrocarbon Oil)

IN THE TREATMENT OF MASTITIS!



- ① Destructive to the causative microorganisms, such as Streptococci, Staphylococci, etc., as authoritatively reported.
- ② Effective in both acute and chronic cases of Mastitis.
- ③ Normally requires only *one* treatment per quarter.
- ④ Inexpensive.

ARMOUR AND COMPANY
VETERINARY DIVISION

Kansas City, Kansas

ARMOUR'S MASTOL is a valuable contribution to the Veterinary Profession . . . can be used with utmost confidence.

Leaflet furnished upon request.

HORSES

ARE ESSENTIAL FOR OUR WAR EFFORT

A widespread outbreak of EQUINE ENCEPHALOMYELITIS in 1942 would be a National Calamity.

ENCEPHALOMYELITIS VACCINE (Chick embryo origin)

has proved to be almost 100% effective as a preventative, *when administered intradermally*. It is not so effective when the dose intended for intradermal use is actually injected subcutaneously.

PUBLICITY

As an aid in encouraging proper immunization of horses (that is, immunization by competent veterinarians) we carried extensive display advertising during May and June in The Weekly Kansas City Star, Prairie Farmer, Wallace's Farmer, The Farmer, The Nebraska Farmer, Wisconsin Agriculturist and Farmer, and Dakota Farmer.

These advertisements appear over the personal signature of Ashe Lockhart (no address used) and urge horse owners to have their horses immunized by a veterinarian. Copies of these advertisements and cards suitable for distribution to your clients will be furnished, free, upon request.

ASHE LOCKHART, INC.

*"Producers of Better Biologicals
for Graduate Veterinarians."*

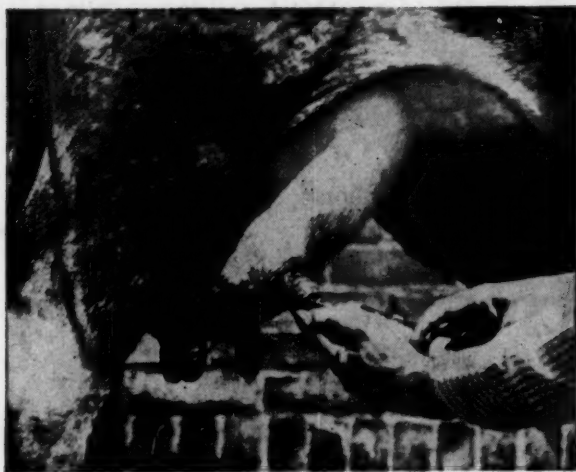
800 Woodswether Road

Kansas City, Missouri

In Canada—Canada Representatives, Ltd.

193-195 Spadina Avenue, Toronto, Ontario

MEMBER
Veterinary Exhibitors Assn



Jen-Sal TY-SIN, the first gramicidin-type product made available commercially for combatting streptococcic mastitis, is backed by a wealth of controlled investigational work conducted by our laboratories as well as independent research institutions and practicing veterinarians.

Studies conducted by our laboratories under general practice conditions indicate that one 40-c.c. dose is approximately 63.2 per cent effective and two 40-c.c. doses administered at interval of 7-10 days is 79.3 per cent effective in eliminating *Streptococcus agalactiae* infection.

Treat

STREPTOCOCCIC MASTITIS* *with*

TY-SIN

*Streptococcus Agalactiae Infection

Gen Sal

TY-SIN is an aqueous-alcoholic suspension containing in each 20 c.c., 40 mg. of TYROTHRICIN.

TY-SIN may be used on lactating or dry cows—exerts only temporary, minimal influence on milk production.

250 c.c. \$3.25

WRITE FOR LITERATURE

JENSEN-SALSBERY LABORATORIES, INC.

KANSAS CITY, MISSOURI

PRINTING PRODUCTS CORPORATION—CHICAGO